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CLINICAL LECTURE

ON

THE GENERAL PRINCIPLES INVOLVED IN AMPUTATION,

With a Consideration of Some Points in the Technique.

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Gentlemen:—The late Sir Wm. Fergusson used to speak of amputation as "one of the meanest, and yet one of the greatest operations in surgery; mean when resorted to if better may be done—great as the only step to give comfort and prolong life." In studying the conditions under which amputations have been resorted to during the past half century, it is astonishing to see how limited in number those conditions are at the present day. Szymanowski once said that "we must reach such a state of perfection in amputation as to consider every amputation a plastic operation;" and with a view to the accomplishment of such an object I desire to direct attention to this subject in the lecture to-day.

There are four periods at which an amputation can be performed: *1. Immediate*—before reaction from shock; *2. Primary*—after reaction but before inflammation; *3. Intermediate*—after inflammation but before suppuration; *4. Secondary*—after suppuration is established. For all practical purposes these four periods can be reduced to the primary and secondary. As a rule, to which there is scarcely an exception, the immediate amputation should not be performed, as the patient is likely to die from shock during the operation. The double shock of the operation and of the injury is apt to kill the patient; and the shock of the injury of the limb may be complicated with shock from injury of some important internal organ from which the patient could never rally, and hence the impropriety of the amputation, and the needless addition of suffering to the patient on account of the operation.

It is sometimes necessary to amputate as soon as consistent with safety. Now, what is to guide the surgeon in his decision of so important a question? In cases of compound comminuted fracture, with injury to the main artery of the limb and with great loss and destruction of tissue in the soft parts, the hæmorrhage is often alarming, and amputation is called for imperatively as the only salvation for the patient. What is the earliest moment a surgeon should operate? Never during profound shock; and the rule which must govern a surgeon is, to employ all known means to control hæmorrhage and to bring about reaction from shock, and wait. If the patient has pallor and coldness of skin, weak and feeble pulse, sighing respiration, non-reacting pupils, traumatic delirium—internal injuries, no amputation is indicated. The earliest possible time an amputation can be performed, under great necessity from hæmorrhage, is when reaction is beginning; but unless the patient is likely to become exsanguined by delay the beginning of reaction is an unfavorable period for operation, and it is wise to defer it until reaction is fully established. Amputation should not be performed with a sub-normal temperature, a cold skin, a feeble rapid pulse, or during traumatic delirium—especially in children. The condition, then, of the temperature, the skin, the character of the pulse and the mental state, are all important factors in the solution of this problem. Delay in performing an amputation was formerly fraught with very great danger from septic infection; but with the modern methods of preventing sepsis in a recent wound, this obstacle is removed; and with antiseptic compresses applied tightly over the bleeding wound, and not above the wound upon sound tissue, hæmorrhage can be controlled and the wound kept from rapid sepsis a sufficient time to give the patient opportunity to react. I have seen an Esmarch elastic bandage applied above a lacerated wound, over sound tissue, and when the flaps were made a certain amount of sloughing followed from the compression. The wound itself is the proper place to apply firm compression, never above the seat of the wound. This point is one of practical importance, because the elastic bandage as a means of controlling hæmorrhage has been misused; instead of applying the compression over the bleeding part, it has been carried above the bleeding part and over sound tissue. As a result of this, gangrene in the flaps may occur, with its accompanying septicæmia.

The mortality of amputations depends upon a variety of conditions; even the state of the weather has been shown to have a causative effect on the death-rate. Hewson has shown that with a rising barometer the average duration of life in the fatal cases was only 7 days, while with a falling barometer the average duration was 13 days; and that 75 per

cent. of the fatal cases died when the barometer was rising. The conclusion is that, while the state of the weather may or may not turn the tide for or against any given patient after amputation, barometric changes materially influence the condition of patients suffering from the effects of severe surgical operations, and have a slight influence upon the death-rate.

Age is also a factor in estimating the mortality after amputations. Holmes has proved "that the risk of amputations is constantly rising throughout life, and that at any given period after 30 years of age the risk is more than twice as great as it was at the same period after birth." Thus if, for example, it may be stated that 5 per cent. is the mortality after amputation in a child at 10 years of age, the mortality at 40 years would be 10 per cent.

The *seat* of the amputation is also an important factor. Amputations of the lower are more fatal than those of the upper extremities. In any given limb the death-rate increases in reference to the proximity of the amputation to the trunk. Thus if, for example, amputation of the thigh be represented by 50 per cent., the leg would be 40 per cent., the arm 25 per cent., the forearm 13 per cent. These figures are far too high since the introduction of antisepsis, but are quoted to show the relative figures in the different amputations.

The *part of the bone* sawn through affects the mortality. The mortality is greater where the shaft is divided so as to expose the medullary canal than where the cancellated tissue of the bone is sawn through; for in the former case, the risks of pyæmia and osteo myelitis are greater than in the latter case.

The primary amputation is much more fatal than the secondary. Sir James Paget states that the mortality is 12 times greater in the former case. This rate is perhaps too high; but the fact that the primary amputation is attended with a greater death-rate is due to the severe character of the injury. It has been stated that the amputation of expediency, performed for the relief of deformity, is attended with a greater mortality than either primary or secondary amputations.

The *general health* of the patient importantly influences the success of an amputation. The condition of the kidneys, lungs, heart, and vascular system, liver, brain, and other important organs, materially affects the results after amputations.

The *previous habits* of the patient is another important factor. A man of dissipated habits has his chances of recovery lessened by his profligate life, while the temperate man has his chances of recovery greatly increased. Pneumonia often causes death after amputations in those cases where the patients have been hard drinkers for many years.

The *hygienic conditions* are most important in affecting the mortality. Patients in the country do better than those in the city, and the latter do better in private practice than in hospitals. Always secure for a patient abundance of fresh air and plenty of sunlight. Too much stress cannot be placed upon his hygienic surroundings. While the weather, age of patient, seat of amputation, the part of the bone sawn through, whether for injury or disease or deformity—above all and beyond all the hygienic conditions stand out foremost; and if we exclude serious organic disease, nothing is so important as the sanitary arrangements. Sir James Y. Simpson showed that five times as many deaths occurred after amputations in large city hospitals as in private and country practice. To-day the mortality in amputations is very much less than in his day, and a large majority of the causes of death following amputations may be said to have been forever eliminated by the application of the principles of science to surgery. We will now discuss the indications for an amputation:

Aneurism.
Malignant disease.
Perforating ulcer of foot.
Uncontrollable hæmorrhage (primary or secondary).
The operation of expediency in deformity, in tumors and tetanus.
A disease of the joint.
The moist variety of gangrene.
In certain compound fractures and dislocations.
Old sloughing and varicose ulcers.
Necrosis of bone.

These ten indications for amputations have thus been arranged in an acrostic, which will always enable the student or surgeon to have at his command the information.

REQUISITES OF A GOOD STUMP.

1. The bone must be amply covered.
2. The flaps must not be adherent to the bone nor exert pressure on traction upon the cicatrix.
3. The nerves must not be adherent to bone or cicatrix.
4. The nerves must be cut high enough so as not to be affect by pressure or by atmospheric changes.
5. The bone must be smooth and capable of bearing firm pressure upon it.

CHARACTERISTICS OF A BAD STUMP.

1. Necrosis at end of bone.	Sequestrum from injury to bone in sawing, by rough use of saw, by suppuration in bone by injury to periosteum, by sawing without irrigation to prevent the saw from acting as an actual cautery.
2. Conical-shaped stump.	Insufficient covering, spasmodic retraction of muscles, growth of bone.
3. Neuralgia of stump.	External pressure, local and constitutional causes, bulbous enlargement, adhesion to cicatrix.

We may now direct attention to a careful study of the technique of the operation in its present perfected state. For the purposes of description of an amputation in general the following points are to be considered in an amputation of the leg:

First—Preparation of patient.

Second—Provision against hæmorrhage before operation.

Third—Formation of a suitable flap.

Fourth—Section of the bone.

Fifth—Provision against hæmorrhage during operation.

Sixth—Treatment of wound.

The preparation of the patient consists in a careful study of the patient's history, and also the special preparation of the member to be removed. Before the operation the heart and lungs should be examined, the urine analyzed, the general habits of the

patient inquired into with reference to intemperance, and opium habit, or previous disease, and other points of interest which influence the treatment after operation, as well as the mortality. In other words, the surgeon should study thoroughly the individual upon whom he is to operate, and make himself complete master of the situation. The local attention to the part consists in thorough ablution, shaving, and free irrigation with carbolic acid or bichloride of mercury solution.

Provision against hæmorrhage before the operation.—The limb should be elevated and held for a few minutes, and at the same time rubbed towards the trunk. The tourniquet should be now placed over the femoral just beneath Poupart's ligament, so as to press against the bone. It should be screwed down quickly upon a bandage placed under the bone and over the artery; if it is slowly turned a large amount of blood will pass into the limb, and the compression is soon sufficient to keep the venous return in the limb, but not enough to prevent arterial blood from entering the limb. Esmarch's bandage is often used instead of Petit's tourniquet, but the amount of oozing following its use is so great that I prefer digital pressure on the tourniquet, when properly applied. If the Esmarch bandage is used and the main vessels are ligated, the irrigation by hot water, as suggested by I. Varick, of Jersey City, will control the oozing better than any other means. If the hot water is employed for this purpose I should recommend that a weak solution of carbolic acid be prepared in anticipation, or else a mild solution of corrosive sublimate (say 1–4000). These solutions have the additional advantage of making doubly sure the aseptic condition of the flaps.

Third stage, formation of suitable flaps.—Circumstances often influence the surgeon as to the kind and shape of flaps in any given case, but if he can operate at a point of election instead of a point of necessity, either the circular skin flap, modified, if necessary, by two lateral sections, which converts the amputation into one of an antero posterior skin-flap of equal length, or Teale's long anterior and short posterior flap, or the bilateral flaps, will be found best in all amputations. Whatever shape may be decided upon, all flaps should consist of skin and connective tissue only, and not muscle. At all points of the body where pressure is made against bone, skin alone covers the part; the os calcis and the olecranon, the tuberosities of the ischium, are good examples of this. If muscle be included in the flap on the supposition that it will form a soft cushion over the divided end of the bone, the fact that the muscle soon completely atrophies takes away the supposed advantage. If the muscle is included there is considerable bleeding from the cut surfaces and there is a much larger wound for healing.

The surgeon having decided on the kind of flap desired, everything is now ready to begin. One assistant gives ether, another hands the instruments, a third holds the limb to be removed, a fourth is responsible for the application of the tourniquet or the elastic bandage, and a fifth sponges and helps tie the vessels. Each assistant must understand his respective duties and he must not interfere with the duties of the others; thus the operation from beginning to end will be executed in perfect order, and with the least possible delay or suffering. The nurse should wash and wring out the sponges used during the operation; and what has been said of antiseptic preparation of the assistants must include the nurse.

The surgeon stands upon the right side of the limb to be removed, so that he can hold back the flaps with the scalpel, and in doing so he must remember to cut with his scalpel directed at right angles to the long axis of the limb, and the cutting edge slightly turned towards the part of the limb to be removed, and never towards the flap. In this way he cannot button-hole the flap, and the edge of the flap being cut at right angles to the long axis of the limb, will not slough, as it will do if the edge is cut obliquely. The flap should consist of skin and connective tissue and deep fascia down to the muscle; but it is not to include the muscle. The blood-vessels nourishing the flap run between the skin and the deep fascia, and if the edges of the flap be cut at right angles and not obliquely, the extreme edge of the flap is bountifully supplied with vessels. In dissecting up the flaps they should be held by the surgeon's fingers, and never by forceps, which contuse the flaps. The surgeon having dissected up the flaps to a convenient distance and holding the flaps back with his left hand, he is now prepared to make a circular section of the muscles down to the bones.

Before cutting the muscles an interosseous flap can be cut, as suggested by Linhart, of Würtzburg. The object of the interosseous membrane flap is to prevent the retraction of the tissues which carry the vessels up out of reach. A small catlin is thrust in close to the tibia and then carried down for about two inches parallel with the bone. The catlin should now cut across until it comes in contact with the edge of the fibula, and then upwards along the edge of the fibula to a point opposite to where the first incision was made. This will cut out a tongue-shaped piece of tissue composed of the interosseous membrane upon which and attached to which the anterior tibial artery is found. This interosseous flap retracts more readily than muscles, and consequently, being cut two inches longer than the muscles, the flap with the artery will be found directly upon the face of the stump.

With a large amputating knife the muscles should be severed at a point just below the point where the base of the flap is attached. It is best to allow for a certain amount of contraction of the muscle after it is cut, and if the circular division is made as described, the cut surface of the muscle extends down so as to be upon a plane corresponding with the bone or bones. A double-tail retractor, or a triple-tail retractor if two bones exist in the extremity, is placed in front of the face of the stump between the bones so as to keep the muscle from being injured during the sawing of the bones.

Fourth stage, section of the bone.—The leg must be firmly held during the sawing, and the assistant supporting the part to be removed must avoid any pressure downwards, this movement being likely to

cause fracture of the bone, or any movement upwards, which is likely to bind the saw and prevent its free movement. When the femur is to be sawn the saw should go through the linea aspera before completely severing the bone, and this will avoid splintering the edge of the linea aspera. When two bones are involved, as the tibia and fibula, they should be sawn upon the same level, remembering to saw through the smaller of the two bones first, so as not to disarticulate the fibula at its upper end. Volkmann has found that rapid sawing causes so much friction that great heat is generated, which produces circular necrosis at the end of the bone. The saw should be used gently and drawn lightly from heel to toe, and the sawing should be performed under continuous irrigation, so as to prevent the development of too much heat from friction. The surgeon should now pass his finger over the surfaces which have been sawn, and remove by Liston's bone-forceps any slight projection or splinter, and then bevel the edge of the tibia so that its sharp crest will not perforate the skin when the flap is drawn down over the face of the stump. If desirable, a small piece of periosteum can be pushed up from the bone before the saw is applied, and then the periosteal flap can be stitched over the front of the bone by a catgut suture. This procedure was formerly in vogue to prevent osteo myelitis, as the periosteal flap united by primary union, so that no suppurative discharge could be absorbed by the medulla.

Fifth stage, provision against hæmorrhage during the operation.—The surgeon should secure and tie the main artery first; then the other arteries in turn according to their sizes. Do not tie veins unless it is necessary. The artery forceps should embrace only the divided end and open mouth of the artery, and the ligature should involve the vessel only, none of the surrounding tissues. Catgut is preferable for ligatures, as it possesses the especial advantage of allowing the stump to be closed. If torsion is employed, the advantages are still greater; but this method is only safe in the hands of surgeons who understand its use thoroughly and are skilled in its practice. After all the vessels are tied or twisted some oozing may occur. This is controlled by hot irrigation, or by packing into the stump a number of antiseptic sponges wrung out in hot bichloride of mercury.

After hæmorrhage is completely arrested and the wound-surface perfectly dry, the last and sixth stage is entered upon, and this leads us to a discussion of a most important subject, viz.: *the treatment of the wound.* The different methods which have been devised are numerous, and many of them complicated. I pass by the Guérin pneumatic occlusion method and the Maisonneuve pneumatic aspiration method as too difficult and complicated for the use of the general practitioner. The cold water dressings as suggested by Liston, and the continuous bath recommended by Langenbeck, are methods to be employed in exceptional cases. Dressings of stumps, for practical purposes, may be reduced to one of two methods: either the closed or the open method. The great majority of cases should be dressed by closing the wound. In treating an amputation wound by the first method, it is assumed that all the details of antiseptic surgery have been carefully carried out; otherwise failure to obtain primary union is certain.[1]

In dressing a stump with a view to obtaining primary union, it is often advantageous to defer permanently closing the stump for several hours. This is especially indicated where there is much oozing from the surface of the wound. By deferring the final dressing for a few hours the wound is not closed until it is perfectly dry, and until a delicate film of coagulated blood glazes the surfaces.[2] Whenever the final dressing has been deferred I have irrigated the wound thoroughly with a hot solution of bichloride of mercury, and then packed with a large number of small sponges which have been taken immediately out of a glass vessel containing a solution of hot bichloride of mercury. The sponges should be wrung out as dry as possible and introduced into the wound, and the flaps brought over the sponges, and then a heavy bandage of antiseptic gauze placed over the stump with but moderate compression. In five or six hours, the patient in the meantime having reacted from the shock, is now perfectly conscious, and will permit, without suffering any pain, the completion of the dressing.

The bandage should be carefully removed from the stump and one by one the sponges removed from the wound; and all oozing having ceased, a thin film of iodoform can be dusted or sprinkled over the flaps and upon the face of the stump. A drainage tube of *red* rubber—because it contains no sulphur—should be placed in contact with the face of the stump, brought out at each angle of the wound, and cut off flush with the surface of the skin. The flaps should now be approximated and the sutures tied. Catgut should be employed; but three or four silver sutures should also be used, because the catgut often absorbed too quickly and the flaps are not held firmly. The silver relaxation sutures can be removed as soon as they show evidence of the slightest irritation. A button or silk suture or horse-hair can be used instead of the silver wire if the surgeon prefers. If the edges have been accurately approximated a thin film of iodoform can be sprinkled over the line of incision, and then the protector and then the hospital gauze lightly placed over the stump. The gauze next to the wound should be wet, having previously stood in a hot solution of bichloride of mercury or carbolic acid. The gauze should be wet, because dry carbolic gauze is not antiseptic unless it is warm. The absorbent cotton can be now placed over the entire stump and held in place by an antiseptic bandage. Over this dressing layers of antiseptic gauze can be placed with the Mackintosh; the latter can be dispensed with as a rule. The superficial dressing of hospital gauze should be dry and quite firmly

[1] These details of wound treatment have already been discussed in a previous lecture, a report of which may be found in THE JOURNAL of August 21, 1886, and it is unnecessary to repeat what has been said in regard to the technique of an aseptic surgical operation.

[2] Some surgeons have objected to deferring the permanent dressing several hours because the patient has come out of the influence of the anæsthetic, and the final dressing must be done while the patient is conscious. The objection is overruled if the sutures are introduced through the flaps but left hanging loosely. There is no pain in the mere approximation of the flaps.

bandaged to the stump, which should be placed upon a splint and bandaged to it.

In three days, if everything has gone on well, the dressing should be changed under irrigation so as to remove the drainage tubes, and a new dressing applied in the manner already described. This second dressing can remain unchanged for a week, and then a new and final dressing can be applied. It is thus evident that by this method all the great principles of wound treatment have been observed.

In exceptional cases, however, it is not best to close the wound because primary intention can not be obtained on account of the peculiar conditions of the wound. In cases of compound fracture, attended with great crushing of bone and soft parts, there is occasionally some contusion over a small area of the wound, which might prevent primary union, but is not sufficient to prevent a satisfactory healing by secondary intention, and thus securing a longer stump. Another circumstance where closing the wound is not best, is in an amputation of emergency, at a place where antiseptic dressings can not be secured immediately. I believe that under such circumstances no attempt should be made to secure primary union, because all the essential conditions are absent, and a failure under these circumstances would expose the patient to serious risks from septic infection. Half-way antiseptic surgery is more dangerous than full exposure of the wound to the air. I believe that leaving the wound fully exposed to the air is not only safe, but is in reality the best method where all the conditions of rigid asepsis cannot be controlled. During the past session I have treated two stumps by the open method, and both of them did just as well as regards constitutional disturbance as the others. The open method has one disadvantage; the wound does not heal so quickly; but it heals satisfactorily in the end. In the open method the highest type of antiseptic surgery is found. The frequent use of carbolic acid renders the soil unsuitable for the growth of germs, the causes of putrefaction. The unobstructed flow of the discharge prevents the secretion becoming putrid. The exposure of the wound permits evaporation, which renders the discharge too highly concentrated for the favorable growth of these germs; and, finally, as Pasteur has shown, this same free exposure, by the supply of oxygen to the microörganisms, prevents their disorganizing and breaking up the albuminous compounds in their struggle for one of the essentials of their being. The preservation of the albuminous compounds diminishes, and even prevents, the processes of putrefaction. The exposure of the wound lessens the chances of decomposition by causing it to become dry.

There is no real inconsistency between antiseptic surgery, as now understood, and treating a wound openly. A careful study of the principles of antiseptic surgery shows that both methods are in accord with its precepts, only that in the open method the wound heals by secondary union, and still the wound is aseptic In the open method the stump is irrigated every few hours with carbolic acid solution. Balsam of Peru is used to stimulate the granulations, and in ten days the granulating surfaces upon the flaps are approximated, and healing takes place between these two granulating, instead of between two fresh, surfaces. In epidemics of diphtheria I have found the open method preferable, because a healthy granulation surface is a barrier to the entrance of septic poison.

In conclusion, gentlemen, endeavor to obtain primary union in all amputations by using every detail requisite to success. When the conditions are unfavorable, aim at secondary union by the open method; but remember that even if the open method is best suited to certain cases, it is still antiseptic surgery in its highest and broadest sense, and that good judgment and a due regard for the best interests of the patient has persuaded you to adopt the method which is less brilliant in its technique, but more brilliant under such circumstances in its ultimate results.

ORIGINAL ARTICLES.

PNEUMATIC DIFFERENTIATION AND THE PNEUMATIC DIFFERENTIAL PROCESS. ITS DEFINITION AND GENERAL SUGGESTIONS FOR ITS APPLICATION.

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The term "pneumatic differentiation" was first used by the author, in an article which appeared in the *New York Medical Record*, January 17, 1885. In this article, or in a subsequent one[1], certain improvements were spoken of which promised to enlarge the scope of the process there described. This paper is written for the purpose of giving a fuller description of what has now come to be known as the "Pneumatic Differential Process."

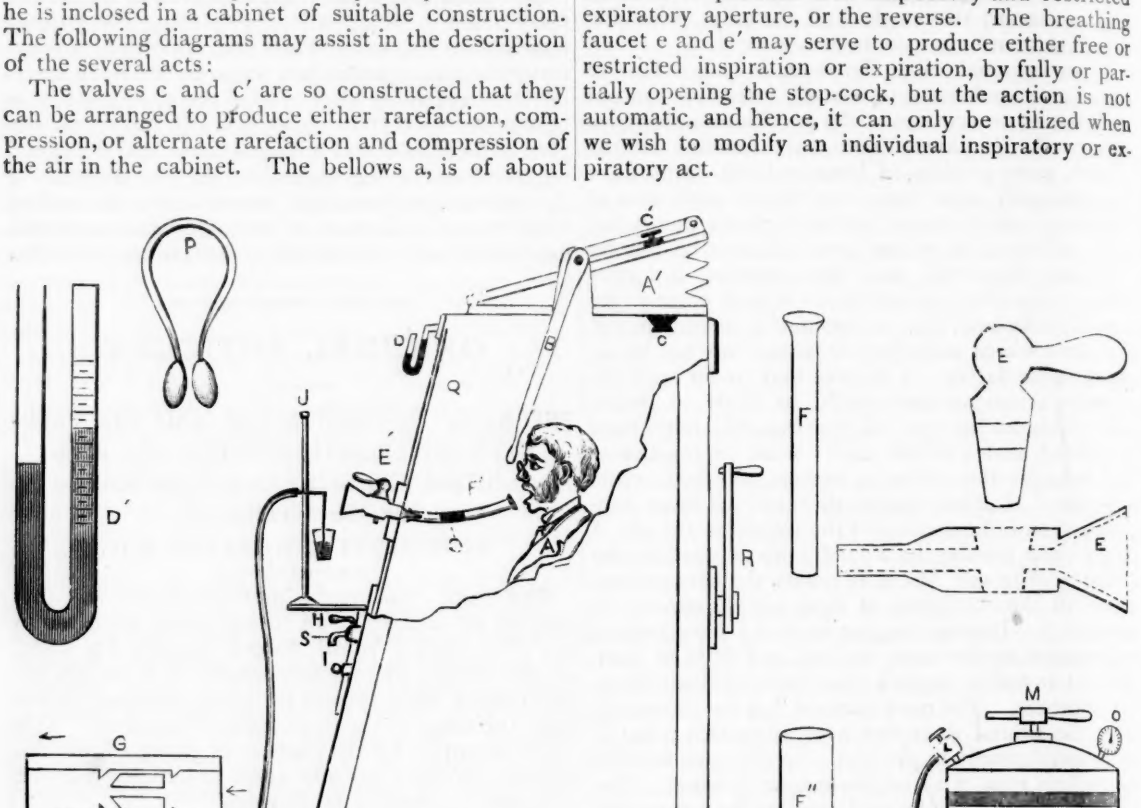
Pneumatic differentiation is the mechanical expression of the thoughts and ideas of two men, a physicist and a physician. However parallel their work may have been to earlier investigators, the labor has been entirely independent, and perhaps for this reason there comes a point of divergence which carries their investigations considerably beyond the labors of Hawk, Lange, Junod and Waldenberg. The cabinet in the hands of lung specialists is capable of nice and skillful adjustment to the various anomalies and contortions that are found where diseased action has not been impeded, and under the control of such in hospitals, sanitaria, or at the residences of patients, a certain range of cases will yield to treatment that might fail of permanent benefit in office practice. But the cabinet and its operation are equally well designed for the larger field of the general practitioner, who from the nature of his work, sees the earliest manifestations of pulmonary disease, and can easily arrange with, perhaps, a younger brother practitioner to secure his patients the benefit that such a radical treatment will confer at the inception of diseased action.

[1]Which appeared in the New York Medical Journal, Oct. 3, 1885.

Description of Terms.—The pneumatic differential process can be said to comprise six principal acts, which may be enumerated as follows: *First*, residual air expansion; *Second*, forced inspiration; *Third*, inspiratory differentiation; *Fourth*, respiratory differentiation; *Fifth*, expiratory differentiation; *Sixth*, forced expiration.

These acts can be produced upon a patient when he is inclosed in a cabinet of suitable construction. The following diagrams may assist in the description of the several acts:

The valves c and c′ are so constructed that they can be arranged to produce either rarefaction, compression, or alternate rarefaction and compression of the air in the cabinet. The bellows a, is of about air current flowing in the direction indicated by the arrows would force the valve into its ground socket, and the circulation of air would continue through the central perforation. The air current being reversed would drive the valve against the shoulders, and the circulation of the air would become free around the valve. Hence, the valve can be used to produce free inspiratory and restricted expiratory aperture, or the reverse. The breathing faucet e and e′ may serve to produce either free or restricted inspiration or expiration, by fully or partially opening the stop-cock, but the action is not automatic, and hence, it can only be utilized when we wish to modify an individual inspiratory or expiratory act.



A, patient. A¹, bellows. B, lever to operate bellows. C, cabinet valve. C¹, bellows valve. D, manometer gauge. D¹, same half size, showing 4-10 in mercury. E¹, breathing faucet in place. E, same detached, showing construction. F, breathing tube. F¹, same in position. F¹¹, bath jar for holding same in aseptic fluid. G, artificial glottis. G¹, same in position. H, adjustable stand for holding vaporizer. I, set-screw for holding same in position. J, vaporizer. K, rubber tube leading to condenser. L, regulator, to control flow of air at any given pressure. M, pressure pump. N, condenser. O, gauge for compressed air condenser. P, nose clip, to compel oral respiration. Q, glass front to cabinet. R, lever for opening same. S, accessory—stop-cock.

$\frac{1}{30}$ the cubic capacity of the cabinet, and of a calculated tensile strength somewhat less than the breaking strain of the cabinet. The artificial reversible glottis G, is so constructed that it can be placed in the breathing tube either at the oral end where it can serve as a mouth piece, or it may be placed farther down if preferred. It is provided with a perforated valve, the circumference of which has been ground to its opposed bearings. Its backward play being checked by two shoulders in the tube. An

The breathing tube, F and F, is designedly of simple construction, which allows easy and complete cleansing. The oral end is expanded and comfortably fits the mouth, being placed between the teeth and lips. The patient while breathing taking care to open the jaws, but keeping the lips firmly around the flange.

I. To produce *Residual air expansion* valves c and c′ are set for rarefaction. The patient is told to make a full inspiration from the air in the cabinet,

and while he is maintaining himself in this act with his mouth and glottis open, rarefaction can be produced to the extent of from 1–2 inches. This will expand such air as may be occluded behind bronchial plugs. If we wish to expand residual intervascular air, the glottis should be gently closed after full inspiration. The patient can indicate by a prearranged movement of the hand, when he is prepared for the removal of the air about him, which, on account of the relative size of the bellows to the cabinet, can be effected in two or three strokes of the lever.

II. *Forced Inspiration.*—The valves c and c′ to remain as before. The rarefaction may be from $\frac{2}{10}$ to 2 inches. The patient now takes the tube in his mouth, and if the higher rarefaction is used the breathing faucet is partially opened and the weight of the normal air seeking to establish an equilibrium with the expanded rarefied inter-pulmonary air, will produce an easy and effectual expansion of the lungs. The expiratory act may be made into the cabinet. This will decrease the rarefaction in the cabinet, and as each respiration proceeds, the breathing aperture in the faucet may be opened wider, or the rarefaction may be kept high by an occasional stroke of the bellows. At a pressure of from $\frac{2}{10}$ to $\frac{6}{10}$ the patient may proceed to the third act.

III. *Inspiratory Differentiation*, which is effected by maintaining continued respiration through the breathing tube during the contrasted air pressures.

This converts the normal active inspiratory act into a passive movement, while the ordinary passive expiration becomes active to a degree dependent upon the extent of differential pressure. The nose-clamp should be used in this act if the posterior pharynx cannot be controlled, to prevent the escape of air, which will not only lower the rarefaction, but more seriously interfere with the full intent of the act, which compels the respiration of an elastic column of air, which after two or three inspirations secures a constant and even expansion from buccal cavity to the remotest alveolus. Radiation of body heat or any slight escape of air into the cabinet will after a few moments reduce the rarefaction, but this can be kept up without disturbing the treatment by the withdrawal of the air syncronously with the inspiratory act. If air is withdrawn from the cabinet when the patient is making an expiratory effort, the amount of energy which he unconsciously exerts to expel the lower differential pressure will be inadequate to overcome the increase. It is not necessary, however, to remove such a large quantity of air at once, for, by the gentle and occasional operation of the bellows, the rarefaction can be maintained, constantly at one point.

IV. *Respiratory Differentiation.*—This has become the principal act of the entire process[2], and its scope will not be reached until we are provided with special apparatus for the operation of its full principle in producing artificial respiration in all forms of suspended animation.

For the treatment of pulmonary disease an excursion of one inch Hg. is sufficient. The valves c and c′ are arranged to produce alternate rarefaction and pressure. The patient now takes the same position as for inspiratory differentiation, having been previously instructed to conduct his respirations syncronously with the movement of the lever, or inspiring in response to the word "in" and expiring at the word "out" as enunciated by the operator. The bellows are closely shut, air inside and outside the cabinet is at equilibrium. The patient takes the breathing tube in his mouth at the word "in," he makes an inspiration. The operator at the same instant depresses the lever and opens the bellows wide, thereby withdrawing about $\frac{1}{30}$ of the atmosphere less the cubic displacement of the patient, and producing a corresponding depression in the mercury. The accessory stop-cock is now opened to allow air to rapidly flow into the cabinet, when equilibrium is again established, which will take place in a few seconds, the accessory stop-cock is closed. The word "out" is called, and the patient makes an expiration. The operator recovers the lever and compresses the air in the cabinet to the limit of the contents of the bellows, which drives the mercury up the left arm of the manometer. These movements can be repeated from five to fifteen times per minute. The inflow or outflow of the respiring air can be retarded by the use of the artificial reversible glottis as already described. Further reference to this will be made in treating of its application to diseases. Should the entire contents of the bellows produce too great a force, the patient may commence respiration with the bellows half open, when its operation, as before, will give a reduced variation each way.

V. *Expiratory Differentiation.*—The valves c and c′ are arranged to produce pressure inside the cabinet, with $\frac{2}{10}$ to $\frac{4}{10}$ the patient will find his inspiration difficult and his expiration easy, just to the extent of the reverse of the inspiratory differential act.

VI. *Forced Expiration.*—Valves c and c′ same as in last act, high pressure from 1 to 2 inches is produced in the cabinet. The patient takes his inspiration from the cabinet air, but makes his expiration through the breathing tube, which the operator must close while the patient is inspiring. The bellows must be operated to keep up the pressure in the cabinet, for the patient is now reducing the pressure by the emptying of his lungs ten to twenty times per minute.

To these six acts another might be added, viz: *Residual Air Compression.* It differs from the last act in that the patient makes a full inspiration at equilibrium then closes glottis, when the operator rapidly produces pressure from 1 to 2 inches. This is exactly the reverse of Residual Air Expansion.

General suggestions for the application of these several acts.—Each patient is to be furnished with a separate breathing tube and jar, labelled for identification, which is to be filled with an aseptic solution in which the breathing tube is to be immersed when not in use. The breathing faucet should be cleansed and disinfected after each treatment; the cabinet should be kept cleansed and frequently disinfected.

[2]Dr. William B. Wood, N. Y. Medical Journal, March 5, 1887.

This can be easily accomplished by allowing the spray or vapor to flow into the cabinet with the door closed. The air should at least be fanned out after each treatment. Cuspadores should be cleansed and disinfected after each treatment—or separate ones supplied each patient. The patient should be so placed in position that a good free movement of the thorax and abdomen can be made. The height of the chair and the distance from the breathing tube should prevent the possibility of the patient acquiring the habit of leaning forward while taking treatment. In warm weather or in heated rooms the cabinet doors should be opened occasionally during the sitting, and the patient gently fanned. A towel should be pinned about the neck of the patient, this should be of sufficient length and breadth to cover the lap, abundance of these should be provided and a fresh one supplied for each treatment. Every detail of refinement not only catches the attention of the patient, but gains his full confidence, and guards him against contamination, contagion and infection.

Patients applying for treatment should be classified if possible, into the following divisions: 1. Developmental, a, connection of faulty respiration, b, calisthenics; 2. Acute non-infectious; 3. Chronic non-infectious; 4. Acute infectious; 5. Chronic infections.

Where it is possible to pre-arrange sittings, patients suffering from acute affections should follow each other, and precede the chronic cases, and es pecially the chronic infectious cases. Scrupulous attention should be given to the cleansing and disinfection of the cabinet, and such accessories as has been in use in such cases. Germicidal sprays and vapors should never be omitted in the treatment of infectious (tubercular) cases, even by those who do not sympathize in the belief of the assertion of their germicidal power.

SUGGESTIONS FOR TREATMENT.

First, as a means of Calisthenics.—Respiratory differentiation should be used at first. This may be conducted with the breathing faucet entirely open, but as the patient's respiratory power increases, it may be but partially open, the alternation of pressures can be made greater, and both respiratory and expiratory acts can be maintained until the pressures are equalized. Should there be a tendency to prolonged expiration, a portion of the sitting should be conducted by forced inspiration with high vacuum and a contracted inspiratory aperture.

The inspiratory muscles may be strengthened by maintaining respiration by expiratory differentiation, with a pressure of $\frac{2}{10}$ to $\frac{4}{10}$, expiratory strength may be acquired by the maintenance of the full inspiratory differentiation. This act should only be used when hæmorrhage has occurred or is anticipated, and in pulmonary congestion. In uncomplicated emphysema gentle respiratory differentiation; expiratory differentiation and forced expiration should be used. When there is complicating bronchial catarrh, the treatment may be interspersed by inspiratory differentiation, or forced inspiration with low vacuum $\frac{2}{10}$ to $\frac{4}{10}$, for the purpose of applying appropriate remedial agents. In bronchiectasis expiratory differention and forced expiration, with high pressure, should be the principal treatment. In simple laryngitis, trachetis, and bronchitis, inspiratory differentiation, forced inspiration, with low vacuum $\frac{2}{10}$ to $\frac{4}{10}$, where spray is projected by means of forced inspiration, calculation must be made upon its deep penetration, and sedative, lubricating and emollient agents alone should be used. Hot spray is more grateful to some conditions than the cold blast.

Acute inflammations of the respiratory tract occurring in persons of full respiratory power, do not well tolerate irritating sprays or vapors, and high pressures are unnecessary. Patients whose laryngeal, tracheal and bronchial mucous surfaces have become inured to the frequent passage of catarrhal inflammatory, and degenerative products are more tolerant to the stronger disinfectants, and where œdematous conditions of the bronchial mucous membrane can be inferred. Lugol's solution, 30–50 per cent may be occasionally used with impunity and benefit.

Ordinary spasmodic neurotic asthma is best treated by forced inspiration, or respiratory differentiation; inspiratory differentiation may be possible, but high vacuum may precipitate a seizure. This act may be made possible by the introduction of a proper anti-spasmodic agent. As to the various functional disorders of the lung, produced by pleural effusions or exudates, the non-aërating lobes and lobules following croupous and catarrhal pneumonias, regional blood stasis due to bronchial occlusion. These conditions should receive as preliminary residual air expansion, or compression, or both, followed by respiratory differentiation and then by forced inspiration, and the sitting concluded by inspiratory differentiation. The sleeplessness of anæmia, anorexia, chlorosis and the amenorrhœa dependent upon these conditions, will all receive direct benefit from inspiratory differentiation.[3] Some forms of heart disease should respond to the same act.

(To be concluded.)

ENTERECTOMY FOR STRANGULATED HERNIA. WITH REPORT OF A CASE.

BY N. B. CARSON, M.D.,
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Has the introduction of antisepsis into surgery improved the results of herniotomy? It is claimed by some that the mortality has been lessened by antiseptic methods. Hamilton says: "Mr. Hey states that he lost three out of every five cases upon whom he operated, but it is my impression that the mortality remains about the same as when Mr. Hey wrote, nearly one hundred years ago."

Bruno Schmidt, (Leipsig)[1] states that the mortality of strangulated hernia before the introduction of Listerism was 45.8 per cent., while the mortality since its introduction has been 36.6 per cent., a re-

[3] E. Tiegel, New Yorker Medizinische Presse, February, 1887.
[1] Verhaud. der. Deut. Gesells. für Chirurg. 12th Cong.

duction of 9.2 per cent.; an improvement not commensurate with the improvement in other abdominal operations. Schmidt accounts for this failure by the parts being already necessarily septic on account of their relations. P. S. Connor[2] reports thirty-three cases of herniotomy, with a death rate of 63.6 per cent., and in but one of these *cases did he attribute the cause of death to the wound*, and in that case tetanus was the cause. From this it will be seen that the improved methods of to-day have done little for this operation.

When we examine the cause of this fearful mortality we find: Shock, peritonitis, paralysis, hæmorrhage, tetanus, erysipelas, and pyæmia set down as the immediate causes, while stricture plays its part later on. The number of deaths from shock, comparatively speaking, is not very great, while peritonitis, generally septic, plays the most active part; and why this is so can be very readily explained when we consider that the bowel is often returned into the abdomen so soon as it begins to show signs of returning circulation and while it is still in a pathological condition. The following statement clearly explains my views: "Strangulated gut returned in the condition, even if there be no openings, and although it has been well washed, is still septic, and the secretions from its surface will set up a septic peritonitis."

Another very frequent cause of peritonitis, and one that is not anticipated as likely to occur as often as autopsies prove it, is perporation after return. Most cases of strangulation come to the surgeon after the hernia has lasted many hours and often days, and after much time has been spent and much damage done in efforts at reduction. Consequently the bowel is so altered in structure that it is with difficulty recognized when cut down upon. As a result of this, if the part is not already destroyed in its entirety, it is most frequently so softened and changed at the line of constriction that little presure is necessary to cause rupture, which often occurs, as proved by autopsies, after its return to the abdomen. Personally I have not been able to verify this, but I recall two cases, one in my own practice, and one of a friend whom I assisted in the operation, wherein the condition of the bowel was such that its return seemed of doubtful propriety; but as evidence of returning circulation, in both cases, soon became apparent it was decided to return it, and as a result after some hours symptoms of rupture supervened and a fatal peritonitis followed. Here the line of constriction was marked, and no doubt if autopsy could have been made we would have found the bowel open where it had been softened by the tight and long-continued pressure. Often these openings are so small that they escape the hasty inspection made at the time of the operation. Gross says: "At the seat of stricture the bowel is usually ulcerated or pierced with apertures commonly so small as hardly to admit of the escape of gas, much less of mucus and feces." In this way many cases of peritonitis can be accounted for, as gas alone without feces is sufficient to set a septic inflammation.

Paralysis of the bowel as the result of strangulation is another cause of death that must be considered. All authorities on strangulated hernia give it as a cause of sufficient occurrence to be noticed. Connor[3] cites two cases wherein he found this condition, and as a consequence of the tight constriction paralysis of the engaged part of the bowel; the peristaltic action remained arrested, the vomiting continued, and the patient died just as if no operation had been performed. As to the other immediate causes of death little need be said, as they are so infrequent as to require no more than passing notice.

Stricture after strangulated hernia is due to cicatrization, says Mr. Treves, and follows upon ulceration, or limited gangrene of the involved bowel. He says he has found four recorded examples of this stricture, in addition to several specimens to be seen in some of the London museums. This condition may follow the relief of the hernia in from one month to some years, and may involve any part of the alimentary tract.

Having now considered the causes of death, the question naturally arises how are we to combat them? Gross says: "It has been proposed when mortification has been limited, to replace the bowel on the supposition that before the slough can separate, the parts immediately around the seat of the disease will have contracted firm adhesions to the neighboring viscera, thus protecting the peritoneal cavity against fecal effusion." He very justly doubts the propriety of such a proceeding, and says he would certainly discountenance it. An example on the part of nature to protect herself is cited by Mr. Treves, wherein Mr. Travers tied a ligature around the small intestine of a dog. The animal died on the third day, and the ends of the bowel were found to enter a kind of cyst, formed by lymph from the peritoneum. While it is true that nature makes many efforts at restoration, she does not succeed sufficiently to be relied upon, and we naturally look in what direction we can best subserve her interests. The great success attending all abdominal operations inclines us to seek in that direction, and the question is asked and answered by Mr. Sheen[4]: "Should herniotomy from within the abdomen be performed in cases of strangulated hernia? This has hitherto hardly been a question for consideration in the minds of most surgeons when about to operate, but I think that in the future it is well that it should be."

As the following case, which occurred in my own practice, bearing upon the subject in question is of more than ordinary interest, I will introduce it here.

N. R., American, aged 12 years, entered my service in the St. Louis Mullanphy Hospital December 12, 1886, with a strangulated inguinal hernia of several days' duration. He stated that on the Wednesday preceding his coming to the hospital (which was on Monday) while skating he was suddenly seized with a severe pain in the abdomen, which he did not locate definitely. He returned home, and his mother administered simple remedies which failed to bring relief. He noticed then for the first time a lump in the right groin about the size of a hickory nut. His mother's

[2] Medical News, Dec. 4, 1886

[3] Medical News, Dec. 4, 1886.

[4] British Medical Journal, February 19, 1887.

attention was called to this, but as it had been there before, and had always gone away of itself, nothing was thought of it. The next day, being no better, a physician was sent for, who ordered opiates, hot water injections and warm applications to the abdomen. From the opiates he obtained only partial relief, and the injections brought away only a few scybala. Vomiting of a dark brownish fluid, free from odor, supervened on the second day, and continued up to the time of his coming to the hospital. When I saw him, in the afternoon, after his entrance into the hospital I found him with a good expression, with a pulse of 100, regular and of good volume, temperature 98.4° F. The abdomen was distended and showed plainly the convolutions of the small intestine. There was but little pain on pressure. In the right groin was an inflamed tumor about the size of a large hen's egg, painful to the touch and pitting on pressure. The tongue was moist and covered in the centre with a thick white coating, while the edges and tip were red. The bowels had moved last on the morning of the accident. There had been no vomiting for some hours. As the symptoms were not urgent I concluded to defer any operative procedure until next morning when his parents would be present to give their consent.

The next morning his condition had not materially changed. His expression was a little more pinched, his pulse was 112, still regular, but not as good volume as the evening before. Temperature 100° F. The tongue was a little dry, but otherwise unchanged; the abdomen was a little more tense; there was no noticeable change in the tumor, and no recurrence of the vomiting. With the consent of his parents it was decided to cut down upon the tumor, and if the bowel was not already open to incise it and allow the escape of the fecal contents.

The sack was opened; there was an escape of two or three drachms of sero-purulent fluid. The knuckle of intestine was destroyed beyond recognition. When this was opened, there was an escape only of very offensive mucus and serum. The parts were now thoroughly washed with a solution of carbolic acid 1-20, and the examination proceeded with. The stricture was so very tight that I felt sure the bowel had been cut through, and if any attempt were made to divide the stricture the adhesions would be broken, and fecal extravasation result; yet if left alone with the hope that the obstruction might be spontaneously removed, the gut might be torn at the site of stricture, as happened in the case of Mr. M. Banks[5] when, after six days of favorable progress, when the bowel had been left *in situ*, it ruptured, and in an hour or two the patient was dead. After carefully considering the case I decided to open the abdomen, resect the bowel, wash out the cavity and thus give my patient, as I thought, the best chance for recovery.

The abdomen was opened in the median line, the dead part of the intestine cut off close to the external ring, and the wound again thoroughly washed with the carbolic solution, and thoroughly dusted with iodoform. I then introduced my hand into the peritoneal cavity, and my finger entered an opening in the intestine at its exit through the external ring, which doubtless resulted from the very slight manipulation necessary. I then grasped it so as to prevent the escape of its contents, and by careful traction drew it out through the median opening. I then discovered that the entire circumference of the bowel had not been strangulated, but only about four-fifths of it, while the remainder had been drawn so tightly to the border of the ring as to completely occlude it. The part above the constriction was distended, and much congested for some inches, while the part below was collapsed. An assistant held the bowel both above and below the opening, the intestinal contents having been pushed up and down, so as to prevent their escape. The abdominal opening was held together, and it and the exposed bowel were protected with hot towels. I then cut away the injured part of the intestine, being careful to reach healthy tissue, and a triangular piece of the mesentery, the free border of which was allowed to project slightly beyond the resected border of the bowel; this was done to prevent sloughing of the cut edges of the bowel, an accident which too frequently interferes with the success of the operation. The edges of the mesentery were first brought together with a continuous suture of carbolized silk No. 2. Then the intestine at its mesenteric junction was carefully adjusted and held by fine interrupted silk sutures. The mucous membrane was next sutured and subsequently the serous and muscular coats. For this the Lembert suture was used. The parts were then thoroughly washed and returned into the abdomen, which was afterwards cleansed with hot water. The opening in the groin was again washed, dusted with iodoform, a bone drainage tube introduced, and closed with catgut suture. The toilet of the peritoneum having been made, the abdominal opening was closed with silk sutures, bichloride and iodoform dressings applied, and the patient returned to bed and surrounded by hot bottles.

Reaction was complete in a few hours; and as the progress of the case to complete recovery was uninterrupted, it will be unnecessary to give it in detail. The highest pulse rate was 120; the highest temperature reached was 100°. The bowels moved spontaneously on the morning of the fifth day, a healthy stool, free from blood, being the result. The only complaint was some colicky pains which gave trouble for some days. He left the hospital six weeks after the operation, and has remained well ever since.

Considerable shock followed the cutting away of the disorganized bowel, and required the hypodermic use of brandy and ether; the pouring of hot water into the belly aided the reaction, although that had already advanced before this was done. Shock, after the cutting away of the dead bowel, is one of the chief dangers of the operation, and unless the patient is in a condition to resist this, it is better to postpone the resection of the dead part until his condition can be improved. I would advise that just before this part of the operation is reached a full hypodermic injection of brandy and morphine, or ether, be given, in order to prevent this shock as much as possible.

[5] Medical Times and Gazette, May 9, 1885.

Another danger—an insurmountable one—is the time required for the operation; in most cases two hours or more. In completing this operation I was a little less than two hours. Had I been fully prepared for such an operation I would have made it in a little over an hour. This is one of the advantages of the abdominal opening. We are thus enabled to reach the parts better, and by so doing hasten the operation.

The questions now arise, can we lessen the great mortality from herniotomy? and how can we do it? After carefully considering the causes of death in these cases, I think the questions can be answered affirmatively, by opening the abdomen and resecting at once the injured bowel in all cases where there is any doubt of the possibility of a return to a healthy condition, provided the patient is able to withstand the shock and long-continued anæsthesia. If, however, there seems a probability of healthy reaction, allow the injured portion to remain outside, covered with hot aseptic towels, until this question can be positively decided. If it is already dead and the condition of the patient unfavorable for immediate operation, open the bowel and await the improvement of the patient.

Resection for gangrene of the bowel has been performed, according to Reichel,[6] 56 times, with 29 deaths; a percentage of 51.44. Treves adds: "It will be seen that the chief cause of death in these operations is peritonitis, and it must be owned that this peritonitis is usually dependent upon some flaw in the details of the operation." After naming these causes he further says: "It is not, therefore, too much to expect that the mortality of the operation may be very greatly diminished by improvement in the details of the operation." Since Reichel's tables were published, in 1883, I have collected from journals and other sources twenty-one cases of resection of the intestine. Of this number eight died and thirteen recovered (one with an artificial anus). These cases are shown in the following table:

Analysis of the above cases shows that death was caused by shock in 3, septic peritonitis in 5. At time of operation 7 were moribund, 4 were in bad condition, 10 were in fair and good condition. Of the latter only 1 died, and that after 8 days of favorable progress, from septic peritonitis caused by ulceration of a suture. Laparotomy was done 6 times with 3 deaths and 3 recoveries. In 2 the patients were moribund, and in the third there was ulceration after 8 days of one of the sutures. In 5 the resection was secondary, with 1 death.

In regard to the treatment of gangrenous intestine: Shall we resect the dead part at once, or shall we incise, and resect later? Statistics favor the secondary operation, but I think when we examine into the causes of death, we can readily explain why it is so. It will be seen that of the 21 cases cited above 8 only were in good, and only 2 in fair condition. Of this number only 1 died, and that was a case of secondary operation. Leaving the bowel *in situ* is not altogether a safe procedure, as we have already cited in a case of rupture at the site of constriction. An accident, similar in some respects, happened in one of my early operations. Finding the bowel gangrenous I opened it and allowed it to remain in place. Some weeks later the patient, having entirely recovered from the effects of the operation, after eating largely of oranges and other fruit given by friends, he was seized with cramps, followed by symptoms of obstruction, from the effects of which he died two days later.

Shall the constriction be divided, or allowed to relieve itself? The most rational thing to do, I think, is to allow it to relieve itself, which it will do if let alone. A relief of all distressing symptoms generally follows the opening of the bowel. Unless we intend

NAME OF OPERATOR AND WHERE REPORTED.	No. of Cases.	Recoveries.	Deaths.	Primary Resections.	Secondary Resections.	Condition of patient at time of operation.	Part removed.	No. of inches.	Laparotomy.	Cause of Death.	REMARKS.
D. V. Dean.	1		1	1		Moribund.	Ileum			Shock.	Not reported.
H. H. Mudd.	3	1	2	3		Moribund, 2 / Fair, 1	"	5, 5, 3.		Shock, 2.	" "
W. H. Folker, Brit. Med. Jour., Aug. 15, 1885.	1	1		1		Bad.	"				Intestine stitched to opening, as condition of patient would not allow complet'n of operat'n
R. Parker, Liverpool Med. Jour. January, 1886.	2		2	2		Moribund, 2.	"	14 in 1	2	Sep. peritonitis, 2.	
M. Banks, London Lancet, April 25, 1885.	1	1		1		Good.	"	3	1		Hernial opening extended to allow return of bowel.
J. C. Stewart, Am. Jour. Med. Sciences, Jan., 1886.	1	1		1		Fair.	"	4			
J. A. Wyeth, N. Y. Med. Jour., March 19, 1887.	1	1			1	Very bad.	"	2½	1		Bowel was left in place 13 days, until condition of pat. imp. sufficiently to allow resect'n.
R. S. Sutton, New Eng'd Med. Monthly, April, 1885.	1		1		1	Good.	"		1	Sep. peritonitis.	This operation was done for cure of artificial anus. Patient died after 8 days from septic peritonitis, caused by ulceration of one of the intestines.
N. Obalinski, Przglad. Lekarsk, xxv, 321.	5	3	2	3	2	Good, 3. / Moribund, 2	"			Sep. peritonitis, 2.	
W. Ström, Norsk. Mag. Laeg., 1886, 4, R. I., p. 573–79.	1	1		1		Bad.	"				
Crespi, Gaz. Med. di Roma, xii, March 1, 1886.	1	1		1		Bad.	"				
C. Villetti, Gaz. Med. di Roma, xii, March 1, 1886.	1	1		1		Good.	"				
Mazzuchelli, Gaz. Med. Ital. Lombard., Nov. 15, 1884.	1	1		1		Fair.	"				
N. B. Carson.	1	1		1		Good.	"	2½	1		

[6] Treves: "Intestinal Obstruction."

to proceed with the operation, it is only adding fresh dangers to interfere with the bowel, or attempt to relieve the constriction. By so doing we allow septic matters to enter the abdomen, an accident which must assuredly have befallen my case had I attempted it.

In conclusion, I would advise, in cases of strangulated hernia: 1st. When the bowel has been out some hours, and when it has been constricted sufficiently to render its return to a healthy condition at all doubtful, that it should be resected at once, if the condition of the patient is such that he or she can withstand the shock of the operation. 2d. If the condition of the patient is such as not to admit of immediate resection, I would advise that the bowel be incised and left *in situ* without interfering with the stricture, until such time as the condition of the patient will allow the more radical operation. 3d. If the resection is to be made as a primary or secondary operation, I would advise that the abdomen be opened in the median line, as by so doing, I believe, we enhance many times the chances of recovery of our patient, while we do not in the least add to the dangers of the operation.

It is unnecessary here to mention the many advantages of this procedure, as any one at all familiar with abdominal surgery can readily appreciate them.

OCULAR TROUBLES OF NASAL ORIGIN.

Read before the Chicago Medical Society, January 17, 1887.

BY BOERNE BETTMAN, M.D.,
OF CHICAGO, ILL.

The close anatomical connection between the eyes and nose favors the spreading of disease from one organ to the other, by direct continuity of tissue, and also through the medium of the circulatory and nervous systems. Numerous pathological conditions of the eyes and lids are directly attributable to abnormal changes in the nose. Treatment directed to the ocular organs under these conditions will, as can well be understood, fail to influence them.

The lachrymal passage is the connecting link between nose and eye. The mucous lining of the lids and eyeballs is but a continuation of that, covering the inner surface of nose and tear ducts. This fact alone would suggest the rationality of seeking the cause of epiphora, redness of the lids and other abnormal conditions in the nose, provided the disturbances cannot be traced to local causes. Oculists have recognized this connection years ago. Mackenzie, Sœlberg Wells, Schweiger and almost all all other authorities, in enumerating the causes of dacryocystitis, do not fail to mention nasal affections. But none of them devote more than a passing notice to this subject. Not even Schirmer, Michels, De Wecker and Landolt, who have written perhaps the most exhaustive treatises on diseases of the tear passages and the lids, seem to have recognized the important rôle played by the nose in the production of the so-called reflex ocular symptoms.

It is only since the publication of Hack's[1] monograph on the operative radical cure of migraine, asthma, hay fever, etc., that the nose has been regarded as the source of certain ocular complaints which have baffled the efforts of the oculists. Hack in his introductory remarks calls attention to the fact that many persons suffering from "cold" are subject to temporary obstruction of the nose. This condition disappears often as rapidly as was its onset. An attempt to investigate the nature of this impediment to breathing will in many instances fail to reveal a pathological change. The introduction of instruments into the nose or other factors giving rise to a reflex action cause the symptoms to vanish. After repeated examinations made at various times, the physician will at last discover that the lumen of the nose is occluded by a swelling of the anterior end of the inferior turbinated bone. The mucous membrane may show a perfectly normal appearance, indicating that the cause of the swelling is due to changes underneath it, in the cavernous spaces, which become filled with blood, bulging the mucous membrane outwards until it at times reaches the septum. This swelling can give rise, as has been proven, to reflex neuroses in various organs, which can furthermore be allayed by destroying the seat of irritation by operative measures. Thus, Hack accounts for certain forms of migraine, asthma, hay-fever, supraorbital neuralgia, vasa motor reflexes of the skin of the face, epiphora, redness of the lids, turgesance of the conjunctival blood vessels and photophobia. Thickening (hypertrophy) of the mucous membrane, polypi, rhinitis, naso-pharyngitis, deviations of the septum also call forth symptoms of irritation in neighboring organs.

I desire to substantiate the above remarks by citing a few cases which did not yield to the ordinary treatment directed to the eyes, but improved immediately after eradicating the abnormal conditions in the nose.

Case 1.—Eugene F., aged 10, consulted me May 1 for an epiphora of both eyes. His mother stated that the boy's eyes were constantly "weeping" when out of doors. The slightest exposure to the wind, dust or heat would provoke a flow of tears down his cheeks, which were quite eroded from the action of the saline fluid. The eyes were bathed in tears, the conjunctiva palpabrarum thickened and congested. Both eyes were emmetropic. To determine the presence or absence of a stricture in the tear passages, I passed the nozzle of an Anel's syringe into the lower caniliculi, and was able to force the water through the nose in a stream. This indicated a perviousness of the ducts. An examination of the nose revealed an extensive swelling of the anterior portion of both inferior turbinated bones. Whenever I touched these parts with a probe, profuse lachrymation immediately set in. Light thrown into the eyes by means of an ophthalmoscope produced violent sneezing. These experiments convinced me of the reflex nature of the epiphora and conjunctivitis. In order to verify the correctness of my diagnosis I instructed the parent to apply a cocaine ointment several times to the Hack's swelling. The effect was most satisfactory. The overflow of tears ceased almost entirely. I made

[1] Dr. Gruening, of New York, was perhaps the first oculist to call attention to Hack's investigations in this country.

deep incisions into the swelling with a knife electrode, and also employed the flat burner. The slough was completely thrown off after ten to fourteen days. The boy was perfectly cured at the end of a month's treatment. I have seen him since and found no change in his condition. The eyes received no treatment.

Case 2.—Mr. J. K., aged 23, has been troubled for five years by the constant presence of "water in his eyes." It is especially annoying during the winter and on windy days and is always aggravated by sudden changes of temperature. The tear passages were pervious; the eyes normal. Both inferior turbinated bones were greatly swollen. Two applications of the flat electrode completely controlled the abnormal condition of nose and eyes.

Case 3.—Emma K., aged 28, also complained of epiphora, but of the left eye only. Eyes and tear ducts normal. The mucous membrane of the left nostril was highly congested and sensitive. She stated that owing to the pain experienced when breathing on a cold or windy day she constantly kept her muff or handkerchief to the left nostril. The right nostril was apparently normal. I recommended an alkaline solution with which to spray the nose. This relieved the difficulty in a comparatively short time.

Case 4.—Another anomalous condition of the nose, which may provoke secondary changes in the eyes, is the presence of polypi. Such a state of affairs was found in the right nostril of Herman S., aged 26. The flow of tears prevented him from performing the duties of cabinet-maker. He constantly had a handkerchief in his hand to wipe away the tears. He also complained of pain in the eyes and shunned strong light. His physician ascribed these symptoms to a cold, and prescribed two solutions, one to be instilled into the eyes, the other to be sniffed up the nose. The polypi were attached to the middle turbinated bone. I removed them with a Jarvis' snare and succeeded in effecting a cure.

Case 5.—Mrs. Catherine W., aged 35, applied for treatment on August 23, for weeping of the eyes and constant pain above the eye-brows. She also stated that the lids itched and frequently became red at the edges. I found a hypermetropic astigmatism of both eyes, also a convergent strabismus of the left one. Her error of refraction was corrected, the left rectus internus tenotimized, without relieving, however the signs of irritation. I therefore surmised that the origin of the trouble was located in the nose. This supposition was found to be correct. Both inferior turbinated bones were immensely swollen. The mucous membrane along the free edges of the middle turbinated was so thickened as to perfectly obliterate the fissura olfactoria. On inquiry I ascertained that the sense of smell was completely gone. Several applications of the cautery had an excellent effect. At home she employed the douche. When last I saw her, a few weeks ago, she no longer complained of difficulty in breathing through the nose. She sleeps with her mouth closed; her sense of smell is as acute as ever, and her eyes appear and feel perfectly well.

Zuckerkandl calls attention to the obstruction of the fissura olfactoria as a possible cause of anosmia (page 62). The subjoined case demonstrates more than any other, the reflex nature of certain ocular affections, and the immediate relief obtained by the application of cocaine to the inferior turbinated bone.

Case 6.—Emma B. aged 16, was led into my office by her mother. She kept both eyes closed, an attempt to separate the lids being followed by a violent blepharospasmus. Eventually I succeeded in obtaining a view of the eyes, which were bathed in tears and extremely sensitive to light. Every time the eyes were exposed to the glare of the light she sneezed violently. The only abnormal condition I could discover was a congestion of the palpebral and ocular conjunctiva. The girl said that her trouble was of two days' duration. She had several similar attacks during the winter months. I found a Hack's swelling in both nostrils. The introduction of the nasal speculum caused flow of tears and sneezing. I soaked two pledgets of cotton in a 5 per cent. solution of cocaine and placed them in the nose. I repeated this twice, allowing the cotton to remain *in situ* five minutes at a time. The effect of the drug was almost immediate. She gradually opened her eyes, and after a lapse of three-quarters of an hour was able to bear the light. I could not prevail upon her to have the parts cauterized. She now employs cocaine to abort attacks, which she has succeeded in doing on two occasions since.

The greater number of cases which have come under my observation during the last two years have been treated with the galvano-cautery. In every instance the heated platinum was employed; three or four applications were made during one sitting. Several patients gave a second and third sitting before satisfactory results were obtained. Applications of the cautery restricted to the anterior end of the inferior turbinated bone, frequently failed in procuring relief. In such cases I usually found a swelling of the posterior parts of the inferior turbinated bones also. John Mackenzie has shown that a sensitive area exists at the posterior end of the inferior turbinated bone, and Sajous has demonstrated another sensitive spot at the anterior part of the nasal cavity near the angle forming the anterior boundary of the vestibule. The erectil tissue covers the whole surface of the inferior turbinated bone, as was originally described by Kohlrausch and later on verified and more minutely described by Voltolini. This would go to prove that the swelling of the mucous membrane covering the inferior turbinated bone may occur over its entire surface, producing secondary irritation throughout the nose. The various forms of rhinitis and deviations of the septum are also amenable to treatment. The duty of a painstaking physician is to investigate the causes of diseases; oculists will do well to subject the nose to a thorough examination in seeking the source of numerous ocular complaints.

18 Central Music Hall.

MEDICAL PROGRESS.

PHYSIOLOGICAL ACTION OF NITROUS OXIDE GAS.—DR. DUDLEY BUXTON has communicated two valuable papers upon the above subject to the Odontological Society, based upon numerous clinical observations and experiments. The effects of nitrous oxide inhalation upon the mammalian organism are, he says broadly speaking—1, a condition of anæsthesia; 2, an emotional state, provoking a sensation of exhilaration—in fact, it plays the *rôle* of a stimulant; 3, it gives rise to modifications of the respiratory and 4, circulatory systems; and 5, provokes marked muscular movements which may be classed as (*a*) rigidity and (*b*) jactitations. The anæsthesia produced by nitrous oxide is not dependent upon analgesia or loss of sensation of painful impressions of the sensory end-organs, such as that produced by cocaine, etc., or upon failure of the conducting sensory nerves, for sensation is retained until the perceptive powers themselves cease to receive; moreover, there is immedialely anterior to the loss of consciousness a hyperæsthetic stage, therefore it may be concluded that the nerve centres are acted upon. The ways by which nitrous oxide may enter the system, and is enabled to produce its special effects are—either that it gives rise to other bodies by changes in its chemical form, or by acting as an irrespirable gas and causing asphyxia, or by exercising a specific action, just as strychnine does. Dr. Frankland came to the conclusion that nitrous oxide was not decomposed during its sojourn in the body, basing his opinion upon analyses made of the air expired by rabbits when confined in an atmosphere of mixed air and nitrous oxide. In the first stage of asphyxia, that of dyspnœa, there is an increase in the respiratory movements, both inspiratory and expiratory; in the second a dominance of the expiratory efforts, culminating in general convulsions, in the last, exhaustion, with long-drawn inspirations, gradually dying out. The blood-pressure during the first and second stages rapidly rises. Dr. Dudley Buxton has never observed an increase in the expiratory movements when HO_2 has been administered, which are merely increased in number and depth, or expiratory convulsions, notwithstanding the gas has been pushed to its utmost limit, and from a large number of sphygmographic tracings the tension in the arteries has been lower than normal. In experiments upon dogs, Dr. Buxton found that where a trephine-hole was made through the skull, during the inhalation of the gas the brain pulsations became more forcible and somewhat hurried; then the brain substance was seen to swell up, until at last it actually protruded through the aperture; whereas in a similar experiment, with the trachea occluded, the brain receded, sinking away from the opening. Other experiments showed that the heart's action was but little interfered with by nitrous oxide, even when inhalations were pushed until respiration was interrupted; during asphyxia, on the other hand, a rapid and continuous increase in blood pressure invariably occurred. The dose of nitrous oxide required to produce insensibility varies very considerably in different persons—a fact which supports the view that nitrous oxide exerts a specific action on the nerve centres. Dr. Buxton also discusses many other interesting points in the action of the gas, such as the occurrence of hallucinations.—*Lancet*, April 9, 1887.

A NEW SUBSTANCE IN THE URINE.—DR. LEO'S researches on sugar in urine are not less interesting, and tend to correct the commonly accepted views on the subject. Professor Scheibler, a chemist well known for his researches on sugar, has observed that the determination of the quantity of that substance contained in a liquid gives different results, according as it is done by Trommer's method or with the polariscope. As sugar now-a-days is exclusively dealt with according to the degree of polarisation, this fact is of enormous value in trade. Scheibler has isolated a substance which is more powerful in that respect than grape-sugar. Dr. Leo's researches yield analogous results, though in a different field. He has examined a great quantity of diabetic urine after three different methods, namely, Trommer's (alkaline solution of copper); by fermentation; and with the polarisation apparatus. In many cases the results agreed, while in others there was a considerable difference. He succeeded in isolating a substance corresponding in its chemical composition to grape-sugar, and also a carbo-hydrate differing considerably from grape-sugar, and turning the plane of polarisation to the left. The power of reduction of this newly-discovered substance is to that of grape-sugar as 1:2.48. Dr. Leo found this substance in three specimens, of diabetic urine, but it was absent in normal urine, although a great amount was examined for that purpose. From this, it may be concluded that the substance does not originate outside the organism, and that it is a pathological product. The theory of Dr. Jaques Meyer, of Carlsbad, that it may be connected with obesity is negatived by the fact that, of the three persons in whom this substance was found, only one was corpulent.—*British Medical Journal*, Jan. 8, 1887.

THE TREATMENT OF ACNE.—LASSAR recommends the following paste for all forms of acne:

B-naphthol	10 parts.
Precipitated sulphur	50 "
Vasoline or lanolin	25 "
Green soap	āā 25 "

This is to be spread upon the skin to the thickness of the back of a knife-blade, and left on for fifteen or twenty minutes, when it will cause a little burning. It is then to be wiped off with a soft cloth, and the skin powdered with talc. The skin soon becomes inflamed, then turns brown, and finally peels off. The desquamation can be hastened by the application of Lassar's paste with 2 per cent. of salicylic acid. When the desquamation has ceased, the acne will be found to be greatly benefited.—*Therap. Monatshaft.*, 1887, No. 1.

THE
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PUBLISHED WEEKLY.

THE EDITOR OF THIS JOURNAL would be glad to receive any items of general interest in regard to local events, or matters that it is desirable to call to the attention of the profession. Letters written for publication or containing items of information should be accompanied by the writer's full name and address, although not necessarily to be published. All communications in regard to editorial work should be addressed to the Editor.

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HIGH PULSE-TENSION.

With our increase in knowledge and means of clinical research has been developed a disposition to undervalue the methods and ideas of our forefathers. With the multiplication of instruments for diagnosis, much of the oldtime dependence upon the eye and finger has been lost. This is particularly true with regard to the pulse. Hence it is with satisfaction that we direct attention to the Croonian Lectures delivered last month in London, before the Royal College of Physicians, by DR. WILLIAM H. BROADBENT, upon "The Pulse." The speaker excused himself for venturing to consider so old a subject on the ground that there has been a great "awakening of interest" in this direction, and that, although much has been learned, there is still a great deal to be acquired. The lectures may be found entire in the *British Medical Journal*, of March 26, April 2 and 9, 1887, and the *Lancet* of the same dates. They are too long for even a cursory review within the limits allotted to this article. Hence, among the many interesting points considered, we shall direct attention to only that of high tension of the pulse.

By tension is meant the degree of intra-vascular blood pressure; "distension might perhaps be more expressive than tension, if less exact and technical." It is shown by fulness of the artery between beats, the vessel lying like a cord under the finger. The pulse is compressed with difficulty, is slow in ascent, long in duration and gradual in its decline, these characteristics being more marked, the larger the vessel. High arterial tension is chiefly due to peripheral resistance, *i. e.*, hinderance to the outflow from the capillaries into the veins. At the same time the heart's action must be vigorous. The causes of increased tension are, according to Broadbent: 1. Hereditary, as shown by the facts that paralysis and heart disease are often found in members of the same family, although of different habits of life, and that functional derangements, due to high pulse-tension, are seen in childhood and throughout life in many families. 2. Kidney disease of all kinds, except such as is attended with suppuration; being most pronounced in contracted kidney. 3. Gout and allied conditions, including almost the entire range of affections attributed by Murchison to functional derangements of the liver. 4. Lead-poisoning, with or without renal disease or gout. 5. Anæmia. This is not fully understood, nor, as Broadbent says, is it invariably the case. 6. Pregnancy. 7. Constipation. 8. Plethora. 9. Chronic bronchitis and emphysema.

The effect upon the heart of a gradual increase of arterial tension is to produce hypertrophy of the left ventricle, so commonly seen in renal cirrhosis. When, however, high tension is suddenly brought about, the heart is liable to dilatation. This explains the danger, which threatens individuals past middle age, particularly in violent or too prolonged exertion, the more if they are the subjects of gout or renal mischief.

As to whether high tension always calls for treatment, Broadbent thinks not, unless it threaten the structural integrity of the heart or brain, in which case it should be lessened. If apoplexy be imminent, blood-letting should be resorted to, and would save life in hundreds of cases in which it is now sacrificed to popular prejudice against venesection. In other instances tension may be relieved by the administration of appropriate drugs, such as the nitrite compounds and the potassium and lithia salts which latter, by promoting metabolism and diuresis, occasion the elimination of those waste products, whose presence in the blood possibly tends to keep up tension by irritating the arterioles and capillaries into contraction.

There is another condition of the circulatory apparatus in which the arteries are contracted upon their contents, while the blood-pressure is in reality low, owing to feebleness of the heart's action. This Broadbent would designate as "virtual tension," and is the characteristic pulse of cardiac dilatation. "Now, as the artery allows itself to be flattened, the pulse wave which lifts it into the cylindrical form appears to be sudden, and the pressure after lasting a certain time, seems to drop suddenly. The artery may be small or large, and the pulse varies accordingly.

We meet with the conditions which give rise to virtual tension at the two extremes of kidney disease. At the outset of acute renal dropsy, while there is obstruction in the arterioles and capillaries, the heart is rendered weak by the pyrexia and low diet, and there is more or less tendency to it throughout the attack. Again, as the heart becomes worn out in the course of chronic granular disease of the kidney, it ceases to be capable of maintaining the high tension which is characteristic of this disease, and virtual tension takes its place." In certain cases of renal disease the pulse is of low rather than high tension. This, according to the speaker, is due to absence of peripheral resistance instead of cardiac failure, and is a bad prognostic sign. It is most often encountered in connection with the large white kidney. The pulse is weak, soft, of low tension, and there is albuminuria.

Low pulse-tension often appears to be physiological and to run in families, as does its opposite. Broadbent thinks that persons with a pulse of low tension tend to accumulate fat, wear out less rapidly, but resist acute disease more feebly, than do individuals with high blood-pressure.

There are many other points in these Croonian Lectures, of which it is to be regretted space does not permit the consideration. A perusal of the lectures in full would repay the busy practitioner, since they not only contain much valuable information, but also abound in practical suggestions. They show Dr. Broadbent to be a man of intelligent observation, who has profited by his wide clinical experience.

WHAT IS THE SAFEST ANÆSTHETIC?

A discussion on the question of the selection of ether or chloroform as an anæsthetic recently took place before the New York Academy of Medicine, which may be taken as giving a fair expression of the opinion of some of the most experienced men in the country in regard to the relative advantages of these two agents. It is perhaps unfortunate that the discussion did not include other anæsthetics, such as bichloride of methyl and the A. C. E. mixture, the latter of which especially is much used at present, though not to an extent to be compared with the use of ether or chloroform.

It is noticeable that the only advocate of chloroform as the preferable anæsthetic as a rule was Dr. Sayre, who has held this view for many years, because the agent is agreeable to take, speedy in action, excites no spasmodic rigidity, and is not followed by the bad effects sometimes seen from ether. His method of giving it is peculiar, as compared with the usual methods. He uses a modification of Lente's inhaler, which by a rubber attachment can be made to fit any face perfectly: thus the patient is not allowed to breathe any air not charged with chloroform. Ten, twenty, or thirty drops of chloroform, he says, will almost always produce anæsthesia in this way; and if from any cause the heart should show signs of weakness the resort to artificial respiration will quickly cause the patient to expire the entire amount of chloroform. Given with a cone a much larger quantity of chloroform is taken into the system than is absolutely required, and when trouble arises a fatal result is more likely to ensue. But are not the large majority of Dr. Sayre's cases young children?

The views expressed by Dr. Knapp are certainly worthy of more than ordinary attention, as from 1860 to 1874 he used chloroform in more than 3,000 cases; and while he had no fatal results he had a number of critical cases. Since 1874 he has used ether exclusively, and has had no ground for complaint, and has found no contraindication for the administration of ether. He gives it by the "choking plan," though at the beginning the patient is allowed sufficient air to prevent the sensation of strangulation so often complained of. He has had no fatal cases, and has not found that the secondary effects are more unpleasant than those of chloroform. But there is one point to be considered in his experience: in several hundred of his cases the average duration of anæsthetization was one minute thirty-seven seconds; and we cannot draw absolute conclusions from an experience in these cases as to what will take place when the anæsthetic is given for long surgical operations. With anæsthetization of one or two minutes there cannot be the same risk to subsequent lung and kidney trouble as when ether is used for half an hour or an hour. And while anæsthesia of two minutes' duration in a case of renal trouble might not be followed by bad effects, it probably would if the agent were used for half an hour.

Dr. Gerster takes a more middle ground regarding these two agents than do most surgeons. While granting that chloroform is by far the more powerful agent, he does not join in the wide condemnation of it; he would have it used more cautiously. And while it is more dangerous at the time of operation, its use is not followed by the secondary affections of the lungs and kidneys seen after the use of ether. He thinks ether contraindicated: 1. When acute or chronic nephritis is present, or is supposed to exist. 2. When there is any chronic pulmonary affection,

especially in the aged, the very young, and feeble persons generally. 3. When it will not produce the complete anæsthesia and relaxation indispensable for the performance of many operations. The presence of a fatty or weak heart of course contraindicates chloroform, as does fright, probably, while it lasts. But valvular lesion is not a contraindication if there be satisfactory compensation by muscular hypertrophy, as shown by the regularity and character of the pulse. In anæmia, as a rule, chloroform is not so safe as ether, nor is it safe in marked nervous depression. But Drs. Weir, Wyeth and Thallon do not admit that nephritis is a positive contraindication to the use of ether. In regard to the pulmonary troubles sometimes seen after the use of ether, Drs. Weir and Abbe point out that these may be avoided by having the patient less exposed during the operation, keeping hot towels about him, and using greater care in transferring him from the operating room. As for the collection of mucus in the air-passages during the administration of ether, Dr. Amidon showed two years ago that it may be avoided by giving atropia hypodermatically before the operation.

It may be said that Dr. Wyeth formulated most clearly the cases in which chloroform is justifiable: 1. In children under six years of age, in whom it is less likely to cause an accumulation of mucus in the trachea and bronchi than ether; and for this class of cases it is preferable because it is more rapid and less irritating in action than ether. 2. In women in childbirth, where the recumbent position is imperative (and we may add, because it acts better than ether). 3. In an emergency when ether cannot be obtained. 4. In a patient who has previously taken ether badly. 5. In an emergency when it is necessary to perform an operation within two or three hours after the ingestion of solid food. 6. In exceptional cases of laryngeal or tracheal stenosis.

It must be said that much of the trouble from anæsthetics is due to careless or faulty administration. There is a wide-spread impression that anyone can give the anæsthetic; and there are many surgeons who still adhere to the towel-cone, giving unknown quantities of ether or chloroform, though it has been repeatedly shown that inhalers should be used. Many surgeons give morphine or atropia, or both, before beginning the anæsthetic; this is a wise precaution, but does not justify carelessness in giving the anæsthetic. Dr. Thallon uses the ordinary inhaler employed by dentists for nitrous oxide gas when giving ether, and with it he has kept up anæsthesia for hours without using more than a quarter of a pound of ether. All anæsthetics are dangerous, and become more so when administered in unknown quantities and in an unsafe manner.

ABORTIVE MEDICATION.

In his *Thèse d'Agrégation* for the Assistant Professorship of Medicine, Dr. De Beurmann recently took for his subject "De la Médication Abortive" (Abortive Medication). The question has often been put, What is abortive Medication? To this the author replies that it is that which is intended to interrupt the course of a malady in its natural evolution. Strictly speaking, abortive medication ought to arrest a malady in its earliest stages, to cure it in an extremely short time, and produce the *restitutio ad integrum* of the organs affected by the morbid process; in other words, to cure in a sure and rapid manner, to diminish notably the length of the duration of the malady, or, as the author expresses it, to jugulate, should be the end of drugs and abortive means. In the present state of science, abortive medication is not yet established, nor yet is the direction in which it should be employed clearly indicated. Medical antisepsis will no doubt become in the future one of the procedures to which one will have the most frequent recourse, and the antiseptics will be placed in the front rank of abortive medicaments. De Beurmann refers to some of the diseases to which the so-called abortive treatment has been applied, the effects of which have till now been more or less satisfactory. For example, numerous drugs have been employed against blenorrhagia, as nitrate of silver, corrosive sublimate, carbolic acid, solutions of the salts of quinine, permanganate of potash, etc. The results obtained have been somewhat encouraging, but the medication may be considered inefficacious, as it is difficult to reach the micro-organisms which have penetrated to the interior of the mucous glands of the urethra. Abortive medication has rendered useful service in the treatment of furuncles, carbuncle, diffuse phlegmon, bubo, etc. Surgeons have aborted boils by a strong application of the tincture of iodine, by injections of carbolic acid; another pretends to have obtained the same result more quickly by making a deep incision at the very beginning of the malady, but this is followed by a prolonged application of spirits of camphor, which is known to possess antiseptic properties, and which should be taken into account in the result of the medication. Some surgeons employ multiple punctures at the commencement of diffuse phlegmon, but M. Le Dentu prefers large incisions which, if employed at the outset of the exudative period, will, according to this surgeon, be capable of arresting the progress of the inflammation, and even of completely preventing suppuration. It is known that the

evolution of charbon is marked by two stages: in the first the infection is local, in the second it is generalized and irremediable. It is sufficient to intervene before the second stage to make the malady abort. This may be done by the eradication of the malignant pustule, followed by deep cauterization and by iodine injections into the periphery of the œdematous zone.

By analogy, the same happy results were hoped for in syphilis, tuberculosis, and other affections. But the utility of the extirpation of the chancre is strongly combated, by a great number of authors, and those among the most competent, absolutly deny any efficacy in the operation. The question is then suggested, whether the constitutional treatment of syphilis may be considered as an abortive medication; to this, however, De Beurmann makes no reply. Another question suggested is, whether tuberculosis is a virulent malady, comparable to syphilis, generalized immediately after inoculation? This doctrine is not without its partisans, but, as De Beurmann suggests, this is no reason why the abortive medication should be neglected in these cases, as most encouraging results have been obtained by the ablation of a local tuberculous mass, anatomical tuberculosis, lupus, masses of osteitis, cold abscesses, etc. In favor of surgical interference, the author argues that certain masses of tuberculosis, local in appearance, are only manifestations of general infection, while others are truly local affections and consequently curable. In puerperal infection antiseptic injections, which have been so much vaunted in these latter times, have given the most brilliant results. Even rabies, which till now has been considered incurable, may be usefully combated by the abortive medication, now known as the method of Pasteur or the anti-rabic inoculations. Against pneumonia, typhoid fever, no abortive remedy has as yet been found efficacious, notwithstanding the daring attempts that have been made in this direction, particularly as regards pneumonia.

The antiseptic injections even in the body of a pneumonic mass are still too recent to judge of their efficacy or otherwise. Intestinal antisepsis and general antisepsis render very great service in typhoid fever, but we cannot really say that they have jugulated the malady. Fortunately the same cannot be said of the salicylate of soda in acute articular rheumatism, and of sulphate of quinine in paludal infection, which are two precious medicaments, and really abortive. It has been asked whether the medication by ether and opium in combination, recently recommended by Dr. Du Castel against small-pox is of any real use in that malady. It appears however, to have attenuated the malady, by aborting the suppurative process.

THE AMERICAN MEDICAL ASSOCIATION AND THE JOURNAL.

As we issue a large extra edition of the present number of THE JOURNAL for general circulation to members of the profession in all parts of the country, we have presented all that we could gather at this date of direct interest to members of the Association, concerning the programme of work, both in general session and in the Sections, and the reductions in railroad fares and hotel charges so far authorized. The programme is incomplete, and it is desirable that further reports of papers and contributors should be forwarded to the Chairman of the Committee of Arrangements as early as possible. The indications thus far point to a large meeting, and one of the most important that has been held in many years. The promised liberal reduction in railroad and hotel charges, and the central position of the place of meeting and its easy access from all directions, are favorable for a large gathering of representatives from every section of our country. And they will certainly receive a cordial welcome from the profession and citizens of Chicago.

The Editor of THE JOURNAL and his assistants will be no less happy to welcome the members of the Association to the publication office, where they can more readily realize the progress made during the little less than four years since the first number of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION was issued. At that date, 1883, and for the preceding five years, the average annual receipts of the Treasurer indicated less than 1,000 members regularly paying the annual membership dues, while since that period the number has increased more than threefold, and with the receipts from subscribers and advertisers, has so increased the income that, instead of $5,000 as in 1883, it will reach not less than $20,000, as will be shown in the forthcoming report of the Treasurer for the current year. And instead of indebtedness, as many feared, they can see a productive surplus of printing material in active use exceeding in cash value $1,058—constituting the nucleus of a printing and publication establishment which, at the end of another decade of judicious business management, will equal a working capital of $10,000, and then doing the work of a weekly journal of nearly double the number of pages of reading-matter printed at present. The present status will justify

the addition of four more pages of reading-matter at the commencement of the next volume. But it should not be forgotten that all true progress must be in the line of natural growth or well-proportioned development.

ILLINOIS STATE MEDICAL SOCIETY.—The annual meeting of this important State organization is to commence in this city on Tuesday, May 17. It is highly important that there should be a full attendance from all parts of the State. Neither the local Committee of Arrangements nor the profession throughout the State should allow the fact that the American Medical Association is to have its annual meeting in the same city only three weeks later, to lessen their interest in, and attention to the professional organization of their own State. The legitimate basis of all efficient general organization of the profession consists of the local City, County and District Societies embracing the general practitioner and specialist alike. Representatives from these make the State Societies; and on the efficiency of the several State organizations will always depend the character, scientific value, and permanency of the National Association.

SWISS DELEGATES TO THE CONGRESS.—We learn with pleasure that the Swiss Confederation have appointed Professor Theodor Rocher, of Berne, Switzerland, and Dr. Henry A. Banga, resident in Chicago, U. S. A., as delegates to the International Medical Congress, to be held in Washington, Sept. 5, 1887.

THE WEST VIRGINIA STATE MEDICAL SOCIETY, will hold its twentieth annual session at White Sulphur Springs, W. Va., July 13, 14 and 15, 1887. The Secretary is J. L. Fullerton, M.D., of Charleston, W. Va.

SOCIETY PROCEEDINGS.

CHICAGO MEDICAL SOCIETY.

Stated Meeting, March 21, 1887.

THE PRESIDENT, E. J. DOERING, M.D., IN THE CHAIR.

(Concluded from page 470.)

DR. WILLIAM T. BELFIELD read a paper on

DIGITAL EXPLORATION OF THE KIDNEY, WITH REPORT OF THREE CASES.

Of some 250 cases of nephrectomy heretofore reported, about 44 per cent. have died from the effects of the operation. The chief causes of death have been:

1. Shock (42 per cent. of the fatal cases).
2. Uræmia (14 per cent.).
3. Peritonitis (21 per cent.).

These three factors were thus responsible for 77 per cent. of all deaths. Improvement in the results of renal surgery seems, therefore, to require means for the avoidance of these three great dangers.

The chances of fatal shock are decreased by early operation, before the patient is exhausted and the damage to kidney tissue extensive through long illness. This self-evident proposition is illustrated by the fact that, while about 18 per cent. of all (250) nephrectomies have died of shock, yet of 24 nephrectomies of fairly healthy kidneys removed for wounds of loin, ureter, for mobility, etc., not a single death occurred from shock.

The greatest obstacle to the early surgical treatment of renal diseases has been *faulty diagnosis*. Such cases are usually treated as lumbago, sciatica, hip-joint disease, and (especially) cystitis, for a long time before the true seat of the lesion is detected or even suspected. Since it is not always remembered that pyelitis produces symptoms identical with those commonly ascribed to cystitis, the former is not suspected, and a diagnosis of cystitis is made; and as cystitis is still too generally regarded as an entity, a disease instead of a mere symptom requiring explanation—the patient is treated for "chronic cystitis." Finally, months or years later, a lumbar swelling or other symptom reveals the renal origin of the difficulty. Meanwhile the patient has become so enfeebled that he succumbs to the shock of an operation that could have been safely borne at an earlier period. Early exploration of the kidney—a comparatively slight operation—has, by drainage of the pelvis, in many cases relieved a difficulty which at a later stage would have required nephrectomy, a formidable operation; moreover, a preliminary drainage has been shown to be a valuable factor in diminishing mortality from nephrectomy. Thus, of seventy-three nephrectomies for suppurative lesions collected by Gross, twelve were made after previous exploration of the kidney, with but one death; of the remaining sixty-one—without previous nephrotomy—thirty-one died.

Uræmia rarely occurs after any renal operation provided the second kidney be present and in healthy condition. While commonly associated with nephrectomy, one of the annexed cases shows that uræmia may be inevitable after simple nephrotomy; hence a necessary preliminary to any renal operation should be an attempt to ascertain the functional condition of the opposite kidney. In the female this can often be accomplished by cauterizing the ureter, after Pawlik's method; in the male probably the best, though still an uncertain, means is Silbermann's instrument for compressing one urereter. (Instrument shown.) The statement that the abdominal incision, by permitting digital examination of the opposite kidney, obviates the dangers of uræmia, is fallacious; for in many cases kidneys which are indistinguishable by the finger, or even by the eye, from normal organs

are extensively invaded by disease—inflammatory, tuberculous or calculous. The pair of kidneys exhibited by Dr. Steele this evening are signal examples —normal in size, contour and consistence, yet each extensively tuberculous. Palpation through an abdominal incision could have detected nothing abnormal in either of these kidneys.

The following cases illustrate several of the principles above enunciated:

S. M., widow, 26 years old, delicate since childhood; has had dyspepsia for years; for a year past has suffered from headache, pain in back and left thigh; menstrual intervals shortened to two or three weeks. Was variously treated for lumbago, sciatica, and ovarian disease. In March, 1886, urination was unduly frequent and sometimes painful; urine contained pus and blood; was treated for cystitis.

On admission is emaciated and feeble; urination every half-hour or oftener, painful; has frequent pain in lumbar region, often shooting down to left thigh; requires morphine constantly. Urine acid, depositing blood, pus, and occasional rosettes of large uric acid crystals.

Diagnosis, calculous pyelitis, probably limited to left side; right ureter catheterized and urine appeared normal.

November 29, 1886, kidney was exposed and pelvis explored; mucous membrane rough and ulcerated, clots of pus evacuated; wound in kidney packed with gauze.

Except for persistent vomiting for a few day, recovery was without notable incident. The renal fistula was closed on the twenty-first day; patient has since been free from all her former symptoms and is regaining flesh and strength.

G. F., 30 years old, was knocked down by a cable car November 28, receiving a lacerated wound of right hand and various contusions. The hand was dressed, and patient presented no notable symptoms until December 11, when often straining at stool he passed a large quantity of blood with the urine and had severe pain and tenderness over the right kidney, with some temperature; these symptoms persisted in spite of rest, ergot, gallic acid and opium; the right loin while not swollen, felt boggy. December 22, the patient having experienced several irregular chills and sweats during the previous day, a lumbar incision was made down to the right kidney. The peri-renal tissues were found closely adherent, extravasated blood was seen under the capsule and a rent one and a quarter inches long was found in the posterior surface of the kidney extending into the pelvis; about half an ounce of a watery fluid lay behind the kidney. A large drainage tube was inserted. The temperature remained high for several days, after which recovery rapidly ensued, and January 14 the patient was discharged well; the wound entirely healed.

C. L., 48 years old, farmer, began some two and a half years ago to suffer from slight pain and stiffness in the loins; later, pus appeared in the urine; was treated for Bright's disease. About a year ago urination became frequent and sometimes painful; was supposed to have cystitis. Has lost flesh; his rest has been much disturbed by frequent calls to urinate. Six months ago he passed two small calculi after some renal colic on left side; since that time has had slight colic on left side several times, followed by expulsion of clumps of pus but no calculi.

Diagnosis, tuberculous or calculous pyelitis, probably former, bacilli were found in one examination of pus, and the lower organs were normal.

Exploration, January 26. The kidney (left) was considerably enlarged; no calculus could be detected with finger or needle. Incision through kidney showed the pelvis considerably dilated, its orifice narrowed by a thickening of upper part of ureter; mucous membrane ulcerated in several places; the pyelitis evidently tuberculous.

Nothing of note occurred until the fifth day, when the urine became scanty and tinged with blood; soon the usual evidences of uræmia became manifest, and death ensued from this cause on the eleventh day. A partial autopsy showed that the right kidney was extensively, the left slightly tuberculous; bladder and prostate normal. Evidently the right kidney, which had never caused pain, had been first diseased; the function of the left, which had latterly been performing most of the renal excretion, had been arrested not by the slight incision, but by the congestion which followed the removal of the accustomed pressure in the dilated pelvis. Similarly uræmia has followed the sudden evacuation of a habitually distended bladder.

To summarize: 1. Surgical affections of the kidneys and its pelvis are frequently masked under symptoms of cystitis, lumbago, hip-joint diseases, etc.

2. Digital exploration of the kidney and its pelvis often affords the only available means for accurate diagnosis in the early stages.

3. When made with due precautions, this operation is almost devoid of danger; while saving the kidney, it may accomplish all that a dangerous nephrectomy could offer at a later stage; and if it fails to cure, it materially increases the chances of recovery from a subsequent nephrectomy.

4. An investigation into the functional condition of the opposite kidney should precede an exploratory incision into the pelvis.

GYNÆCOLOGICAL SOCIETY OF BOSTON.

Stated Meeting, February 10, 1887.

THE PRESIDENT, H. M. FIELD, M.D., IN THE CHAIR.

H. J. HARRIMAN, M.D., SECRETARY.

A paper contributed by DR. APOSTOLI, of Paris, entitled

"ON A NEW METHOD OF TREATMENT OF CHRONIC METRITIS, AND ESPECIALLY ENDO METRITIS, BY THE INTRA-UTERINE CHEMICAL GALVANO-CAUSTIC,"

To be successful in this operation the following electrical instruments are necessary:

First.—A medical galvanometer divided for intensity into milliampères.

Second.—A permanent battery of sufficient size to last for some time and to preserve practically the same strength after several successive operations. The best battery is that of Leclanché.

Third.—An intra-uterine electrode of sufficient length to reach all parts of the uterine cavity and which is not affected by acids, as platinum. It must also be provided with a muff to protect the vagina, the best being a celluloid tube.

Fourth.—A neutral or insensible electrode, which applied to the abdomen, allows a very intense current to pass without pain, without heat and without fear of burns; the best is the one invented by Dr. Apostoli in 1882.

Fifth.—Cords supple enough not to obstruct and resisting enough not be easily broken.

The details of the operation are as follows:

1. Make a tepid and antiseptic vaginal injection, placing the patient as if for an examination by the speculum.

2. Charge the battery, arrange the galvanometer and put in proper position the clay muff.

3. Introduce into the uterine cavity slowly and progressively the electrode previously singed and disinfected.

4. Cauterize the unterine cavity thoroughly and positively in all hæmorrhagic cases and less thoroughly in other cases.

Never surprise the uterus or make a too painful application, for it should be remembered that there are irritable uteri which can receive treatment only in a very mild form. After two or three applications the intensity must be increased, reaching in most cases 100 to 150 milliampères and in some cases to 200 milliampères. The intensity must at first be proportioned and regulated according to the patient's power of endurance; afterward according to the extent and gravity of the lesion and the time it has existed. The duration of the application should vary from five to ten minutes. Applications should be made every week and every second day if required. A rest of several hours should be required of all patients who have been operated upon. This rest is necessary for the safety as well as for the efficacy of the method. Vaginal antiseptic injections night and morning should be ordered. This simple and harmless treatment is only a galvano-chemical scraping, acid or basic, according to cases. It induces a formation of new mucous membrane and forms a kind of intra-uterine exudation, the action of which can be varied at will. Its beneficial effects, which Dr. Apostoli has verified in a great number of instances, does not fail to make itself felt from the first, increasing rapidly and soon restoring the patient to health. It does not condemn the woman to a forced repose and calls for no additional treatment.

Dr. E. W. Cushing did not see any advantage in the method described by the paper over the usual practice of giving ether and curetting the interior of the uterus under antiseptic precautions. He certainly regarded the latter as the shorter and safer method, inasmuch as he understood that Dr. Apostoli's procedure required, in some cases, as many as 90 or 100 applications. He did not understand from the paper whether the desired effect was produced by simple electrolysis or by galvanic cautery; if by electrolysis it was nothing new, as Dr. Cutter has used it in a similar way; if by cauterizing, its extent and depth of destructive action could not be accurately controlled, and thus its action was uncertain.

Dr. L. F. Warner understood from the paper that the action was simply an electrolytic one. He thought that it would be a dangerous method of procedure in the hands of the inexperienced or careless as the degree of effect could not be accurately known. The effect of the application might go so deep as to injure the deeper tissues of the uterus and thus set up an inflammation, or it might not reach deeply enough to remove all the diseased tissue. Unless it has the same effect as curetting it will fail to accomplish its purpose.

OVARIAN TUMOR ATTACHED TO VERTEBRA-BIFID UTERUS.

Dr. E. C. Keller presented a tumor with the following history: Patient 19 years old. Was sent to New England Hospital two months ago and was supposed to be pregnant. She stoutly denied the possibility of such a condition. Upon examination fluid was found in the abdominal cavity and external ballottement gave evidence of a solid tumor. The ascites increased to such an extent as to make relief of some kind necessary. The trocar was introduced twice but no fluid was withdrawn. Subsequent developments showed that the trocar struck the solid tumor both times, and thus prevented the exit of the fluid. The abdomen was then aspirated and four quarts of fluid removed; the remainder of the fluid leaking out after the aspiration. Peritonitis followed the tapping and the radical operation was postponed three weeks. Upon opening the abdomen a solid tumor was found attached to the fourth lumbar vertebra. This tumor had arisen from the left ovary but was attached to the right side. The uterus was bifid. The patient had never menstruated, but last May had molimen. Good recovery.

FOREIGN CORRESPONDENCE

LETTER FROM GLASGOW.[1]

The University — The Hunter Collection in the Museum—Surgery in Glasgow—MacEwen's Osteotomies — Operation for Cerebral Abscess — Radical Operation for Hernia — Cerebral Cyst—Treatment of Fractures—Subcutaneous Osteotomy versus Abdominal Section in Obstetrics.

A walk with Prof. George Buchanan through the various departments of the University of Glasgow soon convinced me that Glasgow may well be proud of her school as every branch has been supplied with every conceivable facility for teaching, regardless of expense. The buildings are located upon a hill in the western part of the city, and are surrounded by a beautiful park. We met Sir William Thompson,

[1] By permission of Drs. Fenger and Senn.

one of the most famous of scientists, in his laboratory busily engaged in his scientific investigations. The weight of advancing years appears to have no effect in diminishing his working power.

Mr. Young, the Curator of the Museum, a most accomplished scholar, very kindly showed me the most interesting specimen in William Hunter's collection. I had here an opportunity of examining the specimens and casts which had been used in illustrating the classical work of Hunter "on the Gravid Uterus." For any one who has had an opportunity to examine the wonderful book it is a great source of satisfaction to study the original specimens from which the illustrations were made. In these days of unsuccessful cholecystotomy it is interesting to look at a specimen of 1,070 gallstones, varying in size from a filbert to a millet seed, taken after death from the same patient. In the collection of urinary calculi I examined with much interest a stone corresponding in shape to the interior of the bladder, and which, as the label stated, weighed 1 pound 2¾ ounces. A number of specimens illustrate the etiological relation between renal calculi and hydro- and pyonephrosis. A number of specimens showed impaction of the renal calculus in the pelvic extremity of the ureter with extensive localized cystic dilatation of the pelvis of the kidney and its calyers. In one case the stone had become arrested near the vesical extremity of the ureter followed by immense dilatation of the tube above the point of obstruction and dilatation of the pelvis of the kidney. The anatomy of the male and female organs of generation is illustrated by numerous careful dissections, some of them have been treated with mercurial injections, which even at this time present the vascular network in a perfect manner.

In the surgical wards the antiseptic treatment of wounds is not thoroughly practiced. I was shown two cases of operation for hæmorrhoids done according to the plan devised by Dr. Lange, of New York. Excision of a circular strip of the ano-rectal mucous membrane with the eclatic veins and suturing of the wound. In one case the operation was attended by serious hæmorrhage, while in the other it was nearly bloodless. Both patients were doing well.

I called on Dr. Wm. MacEwen, whose name has become familiar wherever orthopœdic surgery is practised. He informed me that he had performed his operation of subcutaneous osteotomy with the chisel 900 times for genu valgum and varum and curvature of the leg, and out of this number of cases he never observed a bad result. He is very particular that the line of section in cases of genu valgum and varum should be made above the epiphyseal line by selecting as the fixed landmark a finger's breadth above the external condyle of the femur. The small incision for the chisel is made at a point diametrically opposite and in part of tendon of the adductor magnus, so as to avoid the anastomotica magna artery. In none of his cases had he found it necessary to resort to measures of any kind to arrest hæmorrhage. In the hands of other operators the popliteal artery had been injured, an occurrence which he attributes to carelessness of the chisel. In making the section of bone he directs that the chisel should be always directed away from the artery. In children suffering from rachitis the operation is postponed until the disease has subsided. The process of callus-formation proceeds in the same manner as in subcutaneous fractures. After osteotomy the deformity is at once corrected and the limb immobilized the same as after a fracture. He has divided as many as eight bones at one sitting and has never observed embolism or any other untoward symptoms. For genu valgum he usually applies a well padded splint with a foot board along the outer side of the limb, this splint is fastened upon a cross piece to prevent rotation.

He showed me a case in his private practice where he had operated for cerebral abscess about four weeks ago. The patient was a boy about 7 years of age who had suffered from purulent inflammation of the middle ear with perforation of the tympanum for some time. A number of weeks ago cerebral symptoms appeared, and the mastoid process was opened behind the ear by another surgeon without any benefit. When the boy came under the observation of Dr. MacEwen, he showed distinct signs of mental perturbation; the pulse was slow and the temperature subnormal. The only focal symptom was a slight ptosis on the affected side. From the history of the case and the complexus of cerebral symptoms it was concluded that the patient was suffering from a cerebral abscess. The head was shaved and thoroughly disinfected, and the trephine applied at a point about an inch above and an inch behind the external meatus. When the disc of bone was removed the dura mater appeared tense, but otherwise normal. No cerebral pulsations. A thoroughly disinfected needle was inserted and passed in a downward and forward direction towards the petrous portion of the temporal bone, the supposed seat of the abscess. About an inch from the surface pus was found. The abscess was incised and about an ounce of cream-colored pus escaped. For the purpose of securing more efficient drainage a very small trephine was applied over former site of operation, and an opening made in the floor of the abscess cavity. The middle ear, the primary seat of suppuration, was thoroughly scraped out with a Volkmann's spoon and thoroughly disinfected. The first trephine opening was closed with bone from the disc removed, an aperture sufficiently large being left for the drainage-tube. Another drain was introduced from below, thus securing efficient through drainage. An antiseptic occlusion dressing finished the operation. The effect of the operation was marvellous. The stupor disappeared promptly and full consciousness was restored in a few days. The discharge was slight, and at present the boy runs about and plays, nothing indicating the gravity of the former lesion. The defect in the skull has been almost completely repaired, a slight depression indicating the location of the trephine opening.

Dr. MacEwen places great stress on the importance of replacing the disc of bone *in toto* or in fragments after trephining, for the purpose of obtaining closure of the opening by bone during the reparative process. He is a firm believer that in an aseptic

wound completely detached fragments of bone not only retain their vitality, but take an important part in the process of repair. A number of cases which I saw in his wards would certainly tend to prove the importance of imitating his practice.

This operation for the radical cure of hernia by inversion of sac and closure of inguinal canal by stitching the pillars over each other has yielded the most satisfactory results in his hands. The inverted sac forms a cushion over the double layer of tendinous structures, conditions which necessarily offer a maximum resistance against the subsequent intra-abdominal pressure which, after the ordinary operations, tends so often to a recurrence of the hernia. He has performed the operation a great many times and has lost only one case from peritonitis and has never observed a return of the hernia.

I visited the Royal Infirmary with Dr. MacEwen, and saw another case of cerebral surgery. A little boy about 4 years of age who was running about the ward was pointed out as one of the most recent cases. The lad sustained an injury of the skull in the temporo-parietal region a few months before admission. Almost immediately after the injury hemiplegia was observed on the opposite side. The paralysis remained and was complete on his admission into the hospital. A few weeks ago, under strict antiseptic precautions, the disc of bone was removed over the fissure of Rolando at a point corresponding to the motor centre for the lower extremity. The dura mater was found tense and not pulsating. The dura was incised and several ounces of a clear fluid escaped. Further examination revealed a subdural cyst lined with a brownish membrane, a sharp fragment of bone from the internal table of the skull was found projecting into the brain and was removed. The interior of the cyst was scraped out with a sharp spoon and another smaller opening made in the skull and membranes at a lower point for more complete drainage. The large disc was replaced, only a small opening being left to secure drainage at this place. The case was explained by assuming that the injury produced a fracture of the skull and subdural hæmorrhage sufficient in amount to cause the primary paralysis, and that a cyst formed at the site of the blood clot which kept up the paralysis. The operation was performed about six weeks ago, and was followed immediately by disappearance of paralysis, so that at present both motion and sensation are nearly perfect. The bony wall at site of operation is perfect and only slightly depressed.

Another case of injury to the skull was shown which illustrates in the same striking manner the prompt effect of surgical treatment. A young man in perfect health received an injury to his skull some two years ago. No symptoms attributable to the injury were observed until six weeks ago when patient was attacked with severe headache and epilepsy. He had a hundred or more attacks daily, but never completely lost consciousness. The muscular spasms were limited to the side opposite where the skull was injured. At the point of injury a slight depression could be felt. At this point a disc of bone was removed with the trephine, which directly exposed the brain, showing that the meninges were ruptured at the time the injury occurred. Where the brain was exposed a limited circumscribed area of inflammation and softening was found, but no indications of suppuration. The diseased tissue was removed with a sharp spoon, and although the patient at this time appeared to be thoroughly under the influence of chloroform, he had a violent convulsive attack. The cavity created by the spooning was drained through a defect of the bone disc and the usual antiseptic dressing applied. Since the operation the patient has been free from pain and convulsions, and as the wound is nearly healed we can safely assume that the recovery will be complete.

The three cases related above show conclusively to what extent cerebral surgery can be practiced with success in cases which heretofore were doomed to succumb to certain death. Dr. MacEwen is taking a great interest in this modern department of surgery, and we may safely predict that a man of such ability and indomitable energy will point out new indications and methods of operation for the successful treatment of injuries and pathological conditions of the brain and its envelopes. Dr. MacEwen advocates the propriety of treating subcutaneous transverse fractures of the patella from muscular contraction, by suturing, as he claims that in all such cases bony union by any other measures is prevented by interposition of soft parts between the fractured ends, and that an apparent good result after the ordinary methods of treatment always leads to bad functional results by the gradual elongation of the cicatricial tissue between the bone ends. Fractures of the femur are treated by an outside long splint well cushioned, and short splints surrounding the thigh. After excision of the elbow joint he resorts to passive motion as soon as the wound is healed. During the day the forearm is flexed upon the arm, and supported here with an elastic band passed over the opposite shoulder, which tends gradually to increase the flexion, while at night the arm is straightened by weight and pulley extension.

He makes a very important suggestion to obstetricians by advocating the substitution of subcutaneous osteotomy for the more grave operation of abdominal section in cases of greatly contracted pelves. He claims that his experiments have demonstrated that section of the pubic bone an inch and a half or two inches from the symphysis pubis and section of the ascending rami of the ischium, would add one and one-half inches to the antero-posterior diameter of the pelvis, and that in case more room is required the ilium could be divided on each side. It would seem that this suggestion should be seriously considered by obstetricians, and as Dr. MacEwen is ready to do this operation the first opportunity that presents itself, it is to be hoped that the profession of Glasgow will call upon the master of subcutaneous osteotomy in the first case where such a procedure is indicated, so that he may demonstrate the feasibility and advisability of substituting a simple and safe operation for cases which have been until now subjected to abdominal section, which, so far, has been attended by a fearful mortality. N. SENN.

DOMESTIC CORRESPONDENCE

GALVANIC MEASURE.

Dear Sir:—You have kindly opened your valued pages to me, which I deemed necessary to protect American Electro-therapy from ridicule. I have called attention to the error, and that ends the matter as far as I am concerned, but I beg again for space, not to answer the personal attack made upon me, as that is neither of interest or importance, but to add another word to the subject of galvanic measure, that your readers may understand why I have spoken so positively.

In this progressive age it may seem bold to the superficial observer to say, "that no one ever has used, or ever will use a certain remedy without danger," but the electric current is a force so well known in certain respects, and so exactly measurable, that we can draw the line with assurance; and I am no more a prophet in saying that ten ampères of current can never be used upon the living subject than were I to say that you cannot explode a dynamite cartridge upon the abdomen without serious injury to the subject. About the same effect would be produced by ten ampéres of current. Ten ampères is the current used in the large electric lamps upon our streets; for the inside store or hotel light six ampères are generally employed. If an unfortunate fireman comes in contact with such a current for a moment, in cutting the wire, he is struck dead! The fatal shock is caused by about one-tenth of an ampère, by 100 milliampères, through the high resistance of the human body. The current used for the Brush electric light is about ten ampères; if this is sent through the human body, which, with a dry skin, represents a resistance of 30,000 ohms roughly estimated, one-tenth of an ampère (100 milliampères), strange as it may seem, would be the actual current passing through and causing the fatal stroke!

Such is the effect of 100 milliampères through 30,000 ohms resistance; what would be the effect if ten ampères of current passed through the abdomen? Granting a deep uterus and thin abdominal walls, the tissues intervening between the electrodes offer a resistance of about sixty ohms, and ten ampères through sixty ohms of resistance represent a force equal to *six horse power*! If the resistance is greater, eighty or 100 ohms, as it is likely to be, this current would mean eight or ten horse power. What what would become of an abdomen subject to this energy for five months? Six horse power represents in electro-chemical force a cautery which would burn the tissues like hot iron whatever electrodes might be used; and it is not likely that this, or any approximate intensity ever has been or ever will be serviceable or possible in the healing art. Any scientific electrician will verify these statements.

Very truly yours,

GEO. J. ENGELMANN, M.D.

3003 Locust St., St. Louis, April 26, 1887.

INTERNATIONAL CONGRESS.

NINTH INTERNATIONAL MEDICAL CONGRESS, WASHINGTON, D. C., SEPT. 5, 1887.

COMMITTEE OF ARRANGEMENTS.

The following memorandum is published by order of the local Committee of Arrangements for the information of persons desiring to attend the Ninth Meeting of the International Medical Congress, in Washington, D. C., in 1887.

RATES OF TRANSPORTATION.

Red Star Line, $100; Antwerp to New York and return.

Inman Line, $100; Liverpool to New York and return.

Hamburg Line, $90; Hamburg to New York and return.

Royal Netherlands, $80; Amsterdam to New York and return.

North German Lloyd Line, $187.50; Bremen to New York and return.

Same rates are allowed for the families of members.

Cunard Line, 10 per cent. reduction for members of the Congress.

HOTEL RATES IN WASHINGTON.

Arlington Hotel, from $3.00 to $3.50 per day.
Riggs House, from $3.00 to $3.50 per day.
Willard's Hotel, from $3.00 to $3.50 per day.
Metropolitan Hotel, $3.00 per day.
National Hotel, $3.00 per day.

Other hotels conducted on European style will furnish rooms at $1.00 to $2.00 a day. Good Lodging-houses will also furnish rooms from $1.00 to $1.50 a day.

Proper accommodations have been secured for the meeting places of the Congress and its Sections.

Transportation within the limits of the United States has not yet been determined upon, but will soon be made public. Particulars of the plan of entertainments will be published in the official programme, and all notices will be published in THE JOURNAL in due time.

Official: A. Y. P. GARNETT, *Chairman.*
C. H. A. KLEINSCHMIDT, *Secretary.*

Since the above announcement of the Committee we are informed by Dr. J. W. H. Lovejoy, Chairman of the Sub-Committee on Transportation, that the Cunard Line of Steamships have agreed to include the *families* of members of the Congress, in the reduction of 10 per cent. from their usual rates for the round trip.

Although the regular agents of the White Star Line of Steamships from Liverpool to New York, when applied to by the proper Committee at Washington, refused to make any reduction, as has been heretofore announced, we are reliably informed by Dr. James H. Parkinson, of Sacramento, Cal., that the proprietors of that line have since advertised a reduction of 10 per cent. from the usual rates, to members of the Congress and their families on the *return* trip from New York.

ASSOCIATION ITEMS.

AMERICAN MEDICAL ASSOCIATION.

The Thirty-eighth Annual Session will be held in Chicago, Ill., commencing on Tuesday, June 7, at 11 A.M., in Central Music Hall, corner of State and Randolph streets, and will continue four days. Good rooms for the several Sections will be provided as near the hall for general meetings as possible. Registration books will be open in Central Music Hall on Monday, the day preceding the meeting, for those who wish to register early. In the general meetings of each morning, in addition to the Address of the President of the Association and the Addresses of the Chairmen of the several Sections, the following important subjects will be presented for consideration:

(a) Annual Report of the Board of Trustees for the publication of THE JOURNAL, J. M. Toner, M.D., Washington, Chairman.

(b) Report of the Special Committee on Changes in the Plan of Organization and By-Laws of the Association, N. S. Davis, M.D., Chicago, Chairman.

(c) Report of the Committee on a Monument to Benjamin Rush, A. L. Gihon, M.D., U. S. N., Chairman.

(d) Report of the Special Committee on Cremation, J. M. Keller, M.D., Hot Springs, Ark., Chairman.

(e) Report of the Standing Committee on Meteorological Conditions and their Relations to the Prevalence of Disease; also concerning the Collective Investigation of Disease in Coöperation with the Committee of the British Medical Association, N. S. Davis, M.D., Chicago, Chairman.

(f) An Amendment to Create a "Section on Dermatology and Venereal Diseases, Proposed by Albert L. Gihon, M.D., U. S. N.

The work for the several Sections is not yet completed, but as far as reported is as follows:

I. *Section of Practical Medicine, Materia Medica and Physiology.*

C. N. Cooper, Cleveland, Tenn., "Glanders in the Human Subject, with a Case."

N. S. Davis, Jr., Chicago, Ill., "Value of Antipyrin in the Treatment of Rheumatism."

G. W. McCaskey, Fort Wayne, Ind., "A New Method of Intra-Pulmonary Medication," etc.

Chairman, J. S. Lynch, M.D., Baltimore, Md.; Secretary, J. B. Marvin, M.D., Louisville, Ky.

[We have received no report from the officers of this Section.]

II. *Section of Obstetrics and Diseases of Women.*

J. E. Kelly, New York, N. Y., on "Lithiasis in Pregnancy."

Charles Meigs Wilson, Philadelphia, Pa., "The Technique of Ovariotomy."

Hiram Corson, Plymouth Meeting, Pa., "The Treatment of Abortion."

Wm. T. Taylor, Philadelphia, Pa., "Eclampsia."

W. S. Caldwell, Freeport, Ill., "Intra-Uterine Therapeutics."

George F. French, Minneapolis, Minn., "The Chief Source of Danger from the Use of the Intra-Uterine Sound."

B. E. Hadra, Austin, Texas, "Hysteria and the Ovaries."

Ely Van de Warker, Syracuse, N. Y., "Laparotomy as a Cure for Tuberculosis of the Peritoneum."

John A. Miller, San Francisco, Cal., "Erosions in Ulcerations of the Vaginal Portion and their Relation to Lacerations of the Cervix, with Practical Hints when not to Perform Emmet's Operation."

John Morris, Baltimore, Md., "Treatment of Placenta Prævia."

Wm. M. Findley, Altoona, Pa., "Ante-Partum Hæmorrhage."

Papers have also been promised, more or less definitely, by H. F. Campbell, Augusta, Ga.; L. Ch. Boislinière, St. Louis, Mo.; S. S. Todd, Kansas City, Mo.; E. H. Trenholme, Montreal, Canada; W. M. McPheeters, St. Louis, Mo.; A. McLaren, St. Paul, Minn.; John M. Keating, Philadelphia, Pa.; W. H. Wathen, Louisville, Ky.; W. H. H. Githens, Philadelphia, Pa.; Howard A. Kelly, Philadelphia, Pa.; W. P. Manton, Detroit, Mich.; and A. H. Halberstadt, Pottsville, Pa.

Chairman, F. M. Johnson, M.D., Kansas City, Mo.; Secretary, W. W. Jaggard, M.D., Chicago, Ill.

III. *Section of Surgery and Anatomy.*

H. O. Walker, Detroit, Mich., "External Perineal Urethrotomy, with Report of Eighteen Cases, Instruments, etc."

N. B. Carson, St. Louis, Mo., "Injuries of the Abdomen and their Proper Treatment."

W. C. Wile, Philadelphia, Pa., "Surgical Notes from the Case-Book of a General Practitioner."

I. D. Griffith, Kansas City, Mo. "Skin Grafting."

W. D. Kearns, Pittsburgh, Pa., "Retro-flexed Splints for Fractures of the Forearm."

E. E. Glover, Terre Haute, Ind., "Operative Treatment of Non-Malignant Stricture of the Rectum."

V. P. Gibney, New York, N. Y., "The Management of Cold Abscesses."

R. Harvey Reed, Mansfield, O., "A Case of Calculi in the Appendix Vermiformis."

A. Sidney Roberts, Philadelphia, Pa., "The Mechanical and Operative Treatment of Infantile Spinal and Cerebral Paralyses."

Papers have been promised by Wm. T. Bull, New York, N. Y.; H. Tuholsky, St. Louis, Mo.; and J. McF. Gaston, Atlanta, Ga.

Chairman, H. H. Mudd, M.D., St. Louis, Mo.; Secretary, A. M. Pollock, M.D., Pittsburgh, Pa.

IV. *Section on State Medicine.*

The following gentlemen have promised to read papers upon the subjects mentioned:

Henry B. Baker, Lansing, Mich., "Scientific Collective Investigation of Disease."

Carl H. Horsch, N. H., "The Necessity of Inspection of Food Animals."

J. W. Robertson, Cal., "The Medical Climatology and Hydrology of Northern California."

Prof. V. C. Vaughan, University of Michigan,

"The Chemistry and Physiological Action of Tyrotoxicon."

T. B. Greenley, Ky., "The Hygiene of Infancy and Childhood."

P. H. Millard, Stillwater, Minn., "The Propriety and Necessity of the Regulation of Medical Practice by the State."

H. C. Markham, Independence, Iowa, "State Regulation of Medical Practice—Its Value and Importance."

Major Morse K. Taylor, Surgeon U. S. Army, "The Influence of Military Life on the Health of the Soldier."

Woods Hutchinson, Iowa, "The Physical Basis of Brain-Work."

Walter Wyman, Surgeon U. S. Marine Hospital Service, and several others, have promised papers, but have not yet announced their titles.

The Section is also instructed to submit at the coming meeting of the Association the draft of a law regulating the conditions requisite as preliminary to the study of medicine, the requirements for graduation and for the license to practice medicine, to be urged upon the several States in order to secure uniformity in method and results throughout the United States. It is proposed to discuss this question in connection with the papers of Drs. Millard and Markham above announced. Members of the Association desiring to read papers upon any subject properly coming within the purview of the Section on State Medicine, are requested to notify the Chairman or Secretary at once.

Chairman, George H. Rohé, 611 N. Calvert St., Baltimore, Md.; Secretary, Walter Wyman, U. S. Marine Hospital Service, New York, N. Y.

V. *Section of Ophthalmology and Otology.*

C. M. Hobby, Iowa City, Iowa, "Sympathetic Ophthalmia."

J. L. Thompson, Indianapolis, Ind., "Observations on Displacement of the Crystalline Lens, from Congenital and other Causes."

J. M. Ray, Louisville, Ky., "Hydrobromate of Hyoscine as a Mydriatic."

F. C. Hotz, Chicago, Ill., "Treatment of Hypopyon Keratitis with Frequent Irrigations of Sublimate."

J. W. Heustis, Pittsburgh, Pa., "Some of the Ophthalmological Clinics of Europe."

Robert Tilley, Chicago, Ill., will exhibit "A Boy of 12 years illustrating the results of either Pemphigus or Essential Shrinking of the Conjunctiva in both Eyes."

Dudley S. Reynolds, Louisville, Ky., "Nature and Treatment of Phlyctenular Ophthalmia."

Chairman, X. C. Scott, M.D., Cleveland, Ohio.; Secretary, J. H. Thompson, M.D., Kansas City, Mo.

VI. *Section on Diseases of Children.*

I. A. Larrabee, Somerville, Ky, "Epidermic and Hypodermic Medication of Infants."

I. N. Love, St. Louis, Mo., "Scarlet Fever."

S. B. Sperry, Delafield, Wis., "Aphasia in Children."

W. S. Stuart, Philadelphia, Pa., "New Method of treating Congenital Phymosis."

H. Landis Getz, Marshalltown, Iowa, "Diphtheria."

The following have promised papers: J. M. Dunham, Columbus, Ohio; W. D. Haggard, Nashville, Tenn.; Henry Jameson, Indinapolis, Ind.; J. V. Shoemaker, Philadelphia, Pa.

Chairman, J. S. Knox, 70 Monroe St., Chicago, Ill.; Secretary, W. B. Lawrence, Batesville, Ark.

VII. *Section of Dental and Oral Surgery.*

K. B. Davis, "Pathological Conditions of the Teeth, and their Systemic Effects."

G. Frank Lydston, "The Necessity of Liberal Professional Education in the Practice of Dental and Oral Surgery."

Garrett Newkirk, "The Deciduous Teeth and their Relation to the Health of Children."

A. H. Thompson, "Pathological Heredity, and Congenital Abnormalities of the Teeth."

Arthur Freeman, "Dental Lesions causing Facial Neuralgia and other Neural Phenomena."

W. H. Atkinson, "Sponge Grafting."

Subjects not announced, Chas. Payne, A. E. Baldwin, J. Taft, W. W. Allport, John Marshall.

Chairman, J. S. Marshall, 240 Wabash Ave., Chicago; Secretary, Eugene S. Talbot, 125 State St., Chicago.

VIII. *Section of Medical Jurisprudence.*

Judge Amos G. Hull, New York, "Medical Jurisprudence in its Relations to Undue Influences as Affecting Wills and Contracts."

Joseph F. Edwards, Philadelphia, Pa., "The Suppression of the Illegal Practice of Medicine."

James G. Kiernan, Chicago, Ill., two papers, "State Supervision of the Insane," and "Medico-Legal Relations of Epilepsy."

N. S. Davis, Chicago, Ill., "The Medico-Legal Relations of Alcoholic Liquors, Fermented and Distilled."

Frank S. Billings, Lincoln, Neb., "The Necessity of a Uniform Standard of Education; especially more detailed Pathological Instruction to Unity of Professional Action in Forensic Medicine."

T. D. Crothers, Hartford, Ct., "Mental Responsibility in Inebriety."

S. V. Clevenger, Chicago, Ill., "The Medical Jurisprudence of Mental and Nervous Diseases."

E. C. Spitzka, New York, "Paralytic Conditions in Relation to Testamentary Capacity."

N. E. Brill, New York, "Report on the present state of our knowledge concerning Concussion from Railway Accidents."

Alfred F. Holt, Cambridge, Mass.; W. C. Wile, of Philadelphia, Pa.; F. E. Daniels, Austin, Texas; and Herman J. Boldt, New York, have also partially promised comments.

Chairman, I. N. Quimby, Jersey, City, N. J.; Secretary, W. W. Kimball, Minneapolis, Minn.

[The above incomplete report of work for the several Sections, includes many interesting and important subjects for discussion, and indicates a very general interest in the coming annual meeting of the Association. We shall add other names and topics each week as they may be furnished us.]

RAILWAY RATES.

The following named roads will give reduced fares to all delegates, members, and their families attending the meeting. Return tickets will be issued on the certificate plan *only*. Tickets for the return journey will be sold at ⅓ the highest regular limited fare. If there is no limited fare to a desired point, the price will be ⅓ the unlimited fare. Tickets for the return journey will be limited to continuous passage by first train after they are bought. All tickets for return journey must be accompanied by a certificate signed by the Chairman of the Committee on Transportation, or by an authorized member of the Committee, showing that the holder has attended the meeting. Tickets are good for 10 days from date of purchase.

The roads which will accept return tickets on the certificate plan are:

Baltimore & Ohio (west of the Ohio River).
Buffalo, New York and Philadelphia.
Chicago & Grand Trunk.
Cincinnati, New Orleans & Texas Pacific.
Chicago, Vincennes & Cairo Line.
Chicago & West Michigan.
Chicago, St. Louis & Pittsburgh.
Cincinnati, Hamilton & Dayton.
Cincinnati, Indianapolis, St. Louis & Chicago.
Cincinnati, Washington & Baltimore.
Cleveland, Akron & Columbus.
Cleveland & Marietta.
Cleveland & Pittsburgh.
Cleveland, Columbus, Cincinnati & Indianapolis.
Cleveland, Lorain & Wheeling.
Columbus & Cincinnati Midland.
Columbus, Hocking Valley & Toledo.
Chesapeake & Ohio.
Chicago & Atlantic.
Dayton & Ironton.
Detroit, Lansing & Northern.
Dayton & Union.
Detroit, Grand Haven & Milwaukee.
Evansville & Terre Haute.
Flint & Pere Marquette.
Fort Wayne, Cincinnati & Louisville.
Grand Rapids & Indiana.
Grand Trunk.
Indianapolis & St. Louis.
Indianapolis & Vincennes.
Indianapolis, Bloomington & Western.
Indianapolis, Decatur & Springfield.
Jeffersonville, Madison & Indianapolis.
Kanawa & Ohio.
Lake Erie & Western.
Lake Shore & Michigan Southern.
Lousiville & Nashville.
Louisville, Evansville & St. Louis.
Louisville, New Albany & Chicago.
Michigan Central.
Michigan & Ohio.
New York, Chicago & St. Louis.
New York, Pennsylvania & Ohio.
Niagara Falls Short Line.
Ohio & Mississippi.
Pennsylvania.
Peoria, Decatur & Evansville.
Pittsburgh & Lake Erie.
Pittsburgh & Western.
Pittsburgh, Cincinnati & St. Louis.
Saginaw Valley & St. Louis.
Scioto Valley.
Toledo & Ohio Central.
Toledo, Peoria & Western.
Valley Railway.
Vandalia Line.
Wabash Railway.
Wheeling & Lake Erie.
Baltimore & Ohio (east of Parkersburg, Bellaire & Wheeling.)
Baltimore & Potomac.
Bennington & Rutland.
Boston & Albany (on business between common points in New England and points west of, but not including Albany.)
Boston & Lowell.
Boston, Hoosac Tunnel & Western.
Buffalo, Rochester & Pittsburgh.
Camden & Atlantic.
Central Vermont.
Delaware & Hudson Canal Co.
Delaware, Lackawanna & Western.
Fitchburg.
Lehigh Valley.
New York Central & Hudson River.
New York, Lake Erie & Western.
New York, Ontario & Western.
Norfolk & Western.
Northern Central.
Philadelphia & Erie.
Philadelphia & Reading.
Philadelphia, Wilmington & Baltimore.
Rome, Watertown & Ogdensburg.
Shenandoah Valley.
Troy & Boston.
West Jersey.
West Shore.

The following named lines offer one and one-third fare for round trip:

Burlington, Cedar Rapids & Northern Railway.
Central Iowa Railway.
Chicago & Alton Railroad.
Chicago & Northwestern Railway.
Chicago, Burlington & Northern Railway.
Chicago, Burlington & Quincy Railroad.
Chicago, Milwaukee & St. Paul Railway.
Chicago, Rock Island & Pacific Railway.
Chicago, St. Paul, Minneapolis & Omaha Railway.
Green Bay, Winona & St. Paul Railroad.
Hannibal & St. Joseph Railroad.
Illinois Central Railroad.
Kansas City, St. Joseph & Council Bluffs Railroad.
Milwaukee & Northern Railroad.
Milwaukee, Lake Shore & Western Railway.
Minneapolis & St. Louis Railway.
Minnesota & Northwestern Railroad.
Missouri Pacific Railway.
Rock Island & Peoria Railway.
Sioux City & Pacific Railroad.
Wabash Western Railway.
Wisconsin Central Lines.

[Other roads will be added as heard from. These lists have been prepared at great expenditure of time by the Chairman of the Committee on Transportation,

DR. LISTON H. MONTGOMERY,
Briggs House, 189 Randolph St., Chicago,

who should be addressed for additional information.]

HOTEL RATES.

The following hotels in Chicago will commute their rates to delegates and members and their families attending the annual meeting in June:

Grand Pacific Hotel.—A discount of 50 cents to each person per day in all rooms, except those at $3.00 per day, on which there will be no discount. By this arrangement a $3.50 room with bath may be had for $3.00, a $4.00 room for $3.50 for each person, and so on. A club room will also be placed *free* at the disposal of the Association for headquarters, if desired.

The Sherman House will give 50 cents *per capita* off regular rates, which are $3.50 to $5.00 *per diem*, as well 50 cents *per capita* off $3.00 per day rooms where more than one person occupy a room. Such committee rooms, etc., as may be required will be placed at the disposal of the Association free of cost. No cots are ever used at this hotel, and every one will be given a good bed.

The Tremont House offers 50 cents discount from

regular rates, which are from $3.00 to $4.50 *per diem*. This rate applies to each person or delegate, both included.

The Palmer House gives a rebate of 50 cents *per capita* on the American plan, when two occupy a room. On $1.00 rooms, (European plan) a rebate of 25 cents *per capita* where two occupy a room. On rooms for which the rate is $1.50 and upwards, a rebate (on the European plan) of 50 cents *per capita* is offered.

The Briggs House.—The rates will be $2.00 to $2.50 per day for their *best* rooms, meals included, a reduction of 50 cents per day on transient rates.

McCoy's New European Hotel.—The rate will be 75 cents per day for each person when two or four occupy a room. A single room for one person is $1.00 per day, or for man and wife $1.50 per day.

Clifton House.—Transient rates are $2.50 to $3.50 per day. A reduction of 50 cents per day from the above rates is offered to delegates and their families.

Commercial Hotel.—Transient rates $2.00 to $2.50 per day. For all visitors in attendance at this meeting who stop at this hotel, a discount of 15 per cent. will be allowed on all board and room bills.

Leland Hotel offers accommodations to delegates at $3.00 and $3.50 per day, *i. e.* rooms with board.

The Richelieu, on the European plan only. The rate for single rooms, is from $2.00 to $5.00 per day; suites of rooms proportionately.

All these hotels are within five to eight minutes' walk from Central Music Hall, corner State and Randolph streets.

CHARLES GILMAN SMITH, M.D.,
Chairman Local Committee of Arrangements.
LISTON H. MONTGOMERY, M.D.,
Chairman Committee on Transportation.

RUSH MONUMENT COMMITTEE.—The Rush Monument Committee will meet at Chicago, Illinois, on June 7, proximo. The hour and place of meeting will be announced on the morning of the first day of the meeting of the American Medical Association. Chairmen of local Committees are requested to send their reports of collections to the Treasurer, *Dr. J. M. Toner, 615 Louisiana Ave., Washington, D.C.*, at their earliest opportunity. It is desirable that every State, Territory, and branch of the Government Services represented should make as favorable a showing as possible in the next report of the Committee. GEORGE H. ROHÉ, *Secretary.*

MISCELLANEOUS.

WINDHAM COUNTY (Conn.) MEDICAL SOCIETY.—At the recent regular annual meeting of this Society the following officers and delegates were elected:

President—Charles J. Fox, of Willimantic.

Vice-President—F. G. Sawtelle, of Pomfret.

Secretary and Treasurer—Charles N. Allen, of Moosup.

Censors—W. A. Lewis, of Moosup, T. M. Hills, of Willimantic, E. H. Davis, of Plainfield.

County Medical Reporter—R. Robinson, of Danielsonville.

Fellows to State Medical Society at Hartford in May—T. R. Parker, of Willimantic, Lowell Holbrook, of Thompson, R. Robinson of Danielsonville, W. A. Lewis, of Moosup, H. L. Hammond, of Dayville; alternates, F. O. Bennett, of Willimantic, E. E. Gaylord, of Woodstock, N. Hibbard, of Danielsonville, E. H. Davis, of Plainfield, E. D. Kimball, of Scotland.

Nominating Committee—L. Holbrook; alternate, W. A. Lewis.

Delegates to American Medical Association at Chicago in June—E. A. Hill, of Killingly, T. M. Hills, of Willimantic, F. G. Sawtelle, of Pomfret.

Essayist for 1888—W. W. Foster, of Putnam; alternate, O. B. Griggs, of Willimantic.

The next annual meeting will be held at the Hooker house in Willimantic.

DEPUTY INSPECTOR-GENERAL LLOYD, R. N., of the office of the Director-General of the Medical Department at the Admiralty, has been appointed to represent the British Naval Service at the forthcoming International Medical Congress.

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF OFFICERS SERVING IN THE MEDICAL DEPARTMENT, U. S. ARMY, FROM APRIL 23, 1887, TO APRIL 29, 1887.

Lt.-Col. and Asst. Surgeon J. R. Smith, detailed as member of board to meet in Washington, D. C., April 28, to prepare rules and regulations for the government of the Hospital Corps of the Army. By par. 8, S. O. 92, A. G. O., April 21, 1887.

Major and Surgeon Morse K. Taylor, relieved from duty at Ft. Sill, I. T., May 10, 1887, to proceed home, San Antonio, Texas, preparatory to retirement. Par. 20, S. O. 92, A. G. O., April 21, 1887.

Major and Surgeon Chas. M. Heizmann, detailed as member of board to meet in Washington, D. C., April 28, to prepare rules and regulations for the government of the Hospital Corps of the Army. By par. 8, S. O. 92, A. G. O., April 21, 1887.

Capt. and Asst. Surgeon Fred. C. Ainsworth, detailed as member of board to meet in Washington, D. C., April 28, to prepare rules and regulations for the government of the Hospital Corps of the Army. By par. 8, S. O. 92, A. G. O., April 21, 1887.

First Lieut. and Asst. Surgeon Julian M. Cabell (recently appointed), to proceed to Ft. Omaha, Neb., and report in person to the commanding officer of that post for temporary duty. Par. 19, S. O. 92, A. G. O., April 21, 1887.

First Lieut. Chas. E. Woodruff, Asst. Surgeon (recently appointed), ordered for duty at Ft. Wayne, Mich. S. O. 96, A. G. O., April 26, 1887.

OFFICIAL LIST OF CHANGES IN THE MEDICAL CORPS OF THE U. S. NAVY, DURING THE WEEK ENDING APRIL 30, 1887.

Atlee, E. W., Asst. Surgeon, ordered to the receiving ship "Vermont."

Biddle, Clement, P. A. Surgeon, detached from the Naval Academy, and ordered to Marine Rendezvous, Philadelphia, Pa.

Ashbridge, Richard, P. A. Surgeon, ordered to the Naval Academy.

Hudson, A., Medical Inspector, ordered to the U. S. Str. "Trenton."

Decker, J. Corbin, Asst. Surgeon, detached from the receiving ship "St. Louis," and ordered to the U. S. Str. "Trenton."

Hibbett, C. T., P. A. Surgeon, ordered to the U. S. Str. "Trenton."